THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

A week of comparative quiet has come upon the iron market, but with no change in the conditions that have ruled for weeks relative to supply and demand. The heavy buying movement in July, with the widespread interest in next year's materials that accompanied it, did not create any excitement, as seemed to be likely from some developments. The prices asked for pig iron were calculated to cause many buyers to hesitate, and while inquiry has been plentiful, orders follow with less alacrity. It is a common thing for foundry buyers to provide for the first quarter of 1903 and wait for the situation to unfold further as to the second and third quarters. On the other hand concerns having taken contracts for castings are willing to provide for six months and in some cases nine months of next year. Steel making pig iron is not a factor in the situation to any extent. Purchases of foundry iron are on the basis of $17 Birmingham for No. 2 Southern, while Northern is sold at $21 to $21.50 at furnace for No. 2. The Chicago District reports a 20,000-ton sale of foundry iron for next year, three-fourths of the order going to Northern makers; but the bulk of the week's business has been in smaller lots. The demand for spot iron is still strong, but imports are helping out materially in the East, albeit buyers are not pleased with the makeup of some of the Scotch brands. The steel market is very quiet. Foreign billets can be had at the lowest prices in months, but steel users are holding off. Independent supply will be available shortly for a number of concerns that heretofore have bought from the big companies. Other consumers complain bitterly of the wide spread between pig iron and steel and hint at the possibility of some tariff changes that would cheapen imports. The troubles of the entire trade are still traceable in large degree to the difficulty of getting fuel. Furnaces in the Central West in some instances are as straitened as six months ago, and steel works are not able to make their full outputs. It is quite well settled that a new Bessemer plant will be built at South Chicago, and not an open-hearth works; also that the Mahoning Valley will have a Bessemer steel plant to which three or four merchant furnaces will become tributary. The strong railroad situation, and the heavy booking of rail orders for next year insures a firm billet situation for a good many months. New capacity in plates available in the fall will bring some slight relief, but there is every prospect that the small and moderate consumer of structural steel must pay premiums next year also. The sheet market is for the time the weakest on the list, and detached mills are quoting low prices on galvanized and corrugated sheets, though no reduction by large interests has been announced as yet.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, August 6.

The importation of foreign foundry iron is now being seriously considered by many of the large consumers in this district, and should prices continue to advance for reasonably prompt delivery, there is little doubt that a large tonnage will be brought into Pittsburg. During the past week there have been heavy purchases in the East, aggregating fully 10,000 tons, and the prices on this iron named for early shipment to Pittsburg are so reasonable in comparison with domestic iron that it is only a matter of a few weeks until large tonnages will be placed here. No. 3 Middlesbrough is quoted at $19.25 at seaboard, and it can be brought into this district for $21.50. Of course none of the foundrymen are going to experiment with this foreign material until it is absolutely impossible to secure domestic iron, choosing to pay the higher prices rather than work with a practically unknown article. Several carload lots of No. 2 foundry have been sold during the past few days at $24, prompt delivery being specified, while some furnaces with small lots for prompt shipment in their yards are asking $24.50. The output of the furnaces in the Valleys holds out no encouragement for an increased production during the next few months, as the coke deliveries last week were as bad as they were six months ago. With the furnaces thus handicapped, outputs cannot possibly be increased, and as a majority of the furnaces are heavily oversold there is every indication of further advances.

The market in the past week has been quiet in all lines, and the buying has been limited to small lots almost entirely. Both Bessemer and open-hearth steel billets continue scarce for immediate shipment and producers still ask the high prices that have been ruling for some time. With few exceptions the large steel producers are short of steel billets and sheet bars, but rather than pay the high prices asked in the open market have shut down their finishing mills temporarily. This will certainly affect deliveries in some finished lines, and the producers who hoped to catch up on their orders during the summer months are already sadly disappointed. One large steel producer in this district is reported to have taken contracts for a tonnage 40 percent greater than the output of the plants controlled during the month of July, and other large producers report that despite the unseasonableness of the past month the tonnage closed far exceeded the output of their plants. It is doubtful, however, if this will be duplicated during the present month.

Galvanized and corrugated sheets are being offered at extremely low prices by a number of the independent mills, and in certain cases the prices quoted did not cover the cost of the spelter and the black sheets, to say nothing of the cost of labor. The American Sheet Steel Co. is not meeting the prices of the independent mills, and it is stated that the latter are endeavoring to induce the large consumers of galvanized and corrugated sheets who come into the market in October, to place their orders at the present time instead. A number of orders have already been placed but the greater part of the tonnage is still to be contracted for.

The Cambria Steel Co. has opened its books for plate orders for delivery after Oct. 1, when the new 134-inch plate mill is expected to be in good operating condition. This will help the plate situation to some extent during the last quarter of the year. The Lukens Iron & Steel Co. will also start its new plate mill in the fall.

The statement in this report under date of July 16, that an order for 20,000 tons of Southern open-hearth steel had been

placed by a buyer in the Pittsburg District, deliveries to extend over the next six months, proves to have been in error, though made to the writer in good faith and from a source regarded reliable. The transaction on which the paragraph was based was a provisional one and it is now certain that no material will be delivered.

PIG IRON.—There has been little buying of foundry iron during the past week for delivery in the first half of next year, the tonnages closed by both Northern and Southern furnaces being very small in comparison with the contracts placed during the past two or three weeks. We note the sale of 1,000 tons of Northern No. 2 foundry at $22 delivered, Pittsburg, for delivery the first half of next year, while contracts for two 500-ton lots for the same delivery, Southern No. 2, were placed at $21.15. We also note the sale of 300 tons of Virginia off-basic at $19.15, delivered, Pittsburg. There is practically no demand for Bessemer iron and the furnaces are holding fourth quarter shipment at $21.25 to $21.75 at the furnace. We revise quotations as follows:

Bessemer, Valley	$21 00 to 21 75
Bessemer, Pittsburg	21 75 to 22 50
No. 1 Foundry	24 50 to 25 00
No. 2 Foundry	23 00 to 24 00
No. 3 Foundry	21 75 to 22 25
Gray Forge, Pittsburg	21 00 to 22 00
Chilled Basic, Valley	20 50 to 21 00
Chilled Basic, Pittsburg	21 25 to 21 75

STEEL.—The market continues quiet and sales are limited almost entirely to early deliveries. Open-hearth billets and sheet bars are held at $33 to $33.50, Pittsburg, while Bessemer billets and bars are $32.50 to $33. Foreign billets are finding practically no sale whatever, although they are quoted at $31, Pittsburg, and it is stated that $30.50 might be done on a desirable order. Bessemer rods continue scarce and for prompt shipment as high as $37 has been secured. For delivery the remainder of the year $35.50 to $36 is asked.

SPELTER.—The market continues to rule very strong and we quote prime Western grades at 5.20c to 5.25c, Pittsburg.

FERRO-MANGANESE.—There is no change in the market whatever. The domestic article is quoted at $52.50, nominally while the German product is 25 cents a ton lower. There will be little doing in this market for some time, as all the large consumers placed their orders earlier in the year.

MUCK BAR.—A sale of 500 tons of muck iron for delivery during the next three months is reported at $35.50. Eastern iron is being offered here at $35.

SKELP.—The market continues very quiet, with iron skelp ruling at 2.10c to 2.15c and steel at 2.25c.

RAILS AND TRACK MATERIAL.—Some new business has been placed in standard section rails for delivery through next year, but the orders have been comparatively small. Light rails continue very scarce. We make the following quotations: Standard sections, 50 pounds and over, in lots of 200 tons and over, $28; car lots and less than 200 tons, $30; less than car lots, $32; light rails, 8 pounds, $46; 12 pounds, $44; 16 pounds, $42; 20 pounds, $40; 25 to 40 pounds, $38 to $40. Track material: Spikes, 2c to 2.05c; track bolts, square heads, 2.50c; hexagon heads, 2.65c; fish plates, 1.60c.

BARS.—Current business is good, but none of the local bar mills are making deliveries that are at all satisfactory. Owing to the scarcity of steel some of the mills are shut down, and the current trade is reported so large that back orders are not being caught up very rapidly. We make the following quotations: Bessemer steel bars, 1.60c; open-hearth, 1.70c; plow beams and cultivator beams, 1.60c, net; channels, angles, zees and tees, Bessemer under 3 inches, 1.70c; over 3 inches, 1.80c; bar iron, 1.80c to 1.90c, Pittsburg, with full freight added to point of delivery. Hoops and bands are quoted at 1.90c, full extras, in 250-ton lots and over, and 2c in less than 250-ton lots; refined iron bars, 2.25c and upwards.

PLATES.—Considerable business continues to be placed in plates for delivery next year, while the Cambria Steel Co. promises deliveries on sizes 5-16-inch and over after Oct. 1. For delivery the remainder of the year 1.85c to 2c is asked, while for delivery next year the following agreed quotations are made: Tank plates, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c, and it ranges in price to 3c. Plate more than 100 inches wide, 5c extra 100 pounds. Plate 3-16 of an inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5 cents extra a hundred pounds for less than carload lots. Terms, net cash, in 30 days.

PIPES AND TUBES.—There has been little change in the situation, although new business is not as heavy as it was several weeks ago. All of the mills continue behind on their orders and merchant pipe for prompt delivery commands premiums from warehouse. Quotations to jobbers in carload lots, with freight added to destination, are as follows:

MERCHANT PIPE.

	Black. Per cent.	Galv. Per cent.
⅛ to ⅜ and 11 to 12 inches	60	48
½ to 12 inches	67	55

Discount to consumers in carload lots, Pittsburg, are as follows:

BOILER TUBES.

Steel.

	Per cent.
1 to 1¾ inches	45
2¼ to 5 inches	62½
1¾ to 2¼ and 6 to 13 inches	52½

Iron.

	Per cent.
1 to 1¾ inches	42½
2¼ to 5 inches	50
1¾ to 2¼ and 6 to 13 inches	40

CASING.

	S. and S. Per cent.
2 to 3 inches	58
3¼ to 4 inches	60
4¼ to 12½ inches	63

SHEETS.—There has been considerable cutting in both galvanized and corrugated sheets during the past week and it is reported that some large orders were placed with independent mills. Quotations as low as 4.25c were reported on No. 28. Prices are being maintained by the American Sheet Steel Co. We make the following quotations: Nos. 10 and 12, 2.40c to 2.50c; 14 and 15, 2.50c to 2.60c; 16, 2.60c; 18 and 20, 2.70c to 2.80c; 22 and 24, 2.80c to 2.90c; 26, 2.90c to 3c; 27, 3c to 3.10c; 28, 3.10c to 3.20c; 29, 3.25c to 3.35c; 30, 3.35c to 3.45c. Galvanized sheets, in carload lots to consumers, are quoted at 3.05c for Nos. 10 and 11, 3.45c for Nos. 18 to 21, 4.20c for No. 27, and 4.50c for No. 28. Galvanized sheets, mill shipments in carload lots to consumers are as follows: Nos. 10 and 11, 3.05c; Nos. 12 to 14, 3.15c; Nos. 15 to 17, 3.25c; Nos. 18 to 21, 3.45c; Nos. 22 to 24, 3.75c; Nos. 25 and 26, 4c; No. 27, 4.25c; No. 28, 4.50c.

WIRE AND WIRE NAILS.—The market continues quiet in wire and wire nails although a good demand is expected to set in early in September. We make the following quotations: Wire nails in carload lots, $2.05 per keg; smaller lots, $2.10 and $2.15; plain wire, $2 in carload lots and $2.10 in less than carload lots to retailers; galvanized wire, $2.40 in carload lots; polished staples, $2.20, and galvanized staples, $2.60; painted barb wire, $2.60, and galvanized, $2.90. These prices are quoted on a Pittsburg base plus the actual freight to destination. Cut nails are held at $2.05 in carload lots and $2.10 in less than carload lots, Pittsburg, plus freight to destination.

MERCHANT STEEL.—The manufacturers of high grades of steel report an excellent midsummer demand, but as the tonnage is much smaller than during the earlier months of the year many of the mills have been enabled to catch up on their tonnage to a large extent. We quote as follows: Turned, cold rolled ground shafting in carload lots 47 off, and in less than carload lots, 42 off; tire steel, 2.25c to 2.30c; toe calk, 2.35c to 2.45c; sleigh shoes, 2.25c to 2.35c; machinery steel, 1.70; smooth machinery steel, 1.75. Tool steel, 7 cents and upwards.

OLD MATERIAL.—The market is extremely quiet, although there is a great scarcity of heavy melting stock which the large number of open-hearth plants eagerly purchase. Our quotations, gross tons, are as follows: Cast scrap, $18 to $19; heavy melting stock, $21 to $21.50; No. 1 wrought scrap, $22 to $22.25; steel rails for rerolling purposes, $23; car wheels, $21.25 to $21.50.

COKE.—The Connellsville *Courier* estimates the coke production of the Upper Connellsville region for the week ending Saturday, July 26, at 249,615 tons and that of the lower region at 38,848 tons. Despite this immense production the furnaces in the Pittsburg district and in the Valleys are unable to secure sufficient coke to operate properly. High prices continue for

small lots for prompt shipment and from $3.50 to $4 is asked for an occasional lot of furnace coke. On contracts $2.25 is quoted for furnace and $2.75 to $3 for foundry while outside coke is held at almost the same prices.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
519 MONADNOCK BLOCK, August 5.

There has not been the activity in the sale of iron and steel in this territory in the last week which prevailed during the month of July. Most of the large consumers, whose custom it is to buy about this time, covered for their wants in that month, and the present buying movement is confined almost entirely to that class of the trade whose orders average a few hundred tons. These aggregate a tonnage not much below the figures of recent weeks, and in ordinary times would be considered far above the average. The change is rather welcomed by sellers, as the market gains stability from it and the apprehension of higher prices is removed for a time. Of all branches of the trade, pig iron has been the most active. The demand for finished material is steady, and with the exception of bar iron and wire products, it is all for delivery next year. In heavy sizes of bar iron and steel it is difficult to get delivery within three to four months. There was a meeting of the independent manufacturers of wire nails, fencing, etc., in this city last week, which reaffirmed present prices for these materials. Scrap continues to maintain its past firmness, though buying is limited. Coke is scarce and commands a premium for spot delivery.

It is reported that there has been considerable talk among manufacturers of finished iron and steel, who are dependent upon large steel works for their supply of raw material, of petitioning Congress for the reduction of the tariff on such raw material. They make their plea on the ground that this tariff, while a benefit to the large producers is a burden to the smaller manufacturer and to the public generally. It is stated that concerted action will be taken shortly.

PIG IRON.—There was a marked increase in the number of buyers from among the rank and file of the foundry trade in the last days of July and the first few days of August, and though their individual orders rarely exceed 500 to 800 tons, the total sales of the week give a slight indication of the tremendous activity of melters everywhere. Some large orders were placed during the week, notably one for 20,000 tons by a local company, 15,000 tons of which went to Northern furnaces and the balance to the South. The bulk of the iron sold in the past week was for delivery in the first six months of the year. It is becoming difficult to get iron for delivery in the first quarter of 1903, and those furnaces that have it to offer are asking 50 cents to $1 a ton more than for devlivery later in the year. Silvery irons of 6 to 10 percent silicon have found many purchasers in the last week and the price of it has advanced $1 a ton. There have been many offers for spot iron, an order for 500 tons of No. 2 foundry, for which $24.50 a ton, delivered, was offered, having gone begging all week. We note a sale of 1,000 tons of No. 2 for delivery in October, November and December, at $20 a ton at the furnace, made last week. Already a number of furnaces, among which are some Northern stacks, have notified their agents to sell no more iron for delivery in the first half of next year. We have revised our quotations of Northern iron, which have been advanced as a result of the scarcity of material. We quote as follows:

Lake Sup. Charcoal	$25 00 to $26 00	Southern Coke No. 4	$19 65 to $20 65
Local Coke Fdy. No. 1	23 50 to 24 00	Southern No. 1 Soft	21 15 to 22 15
Local Coke Fdy. No 2	22 75 to 23 25	Southern No. 2 Soft	20 65 to 21 65
Local Coke Fdy. No. 3	22 25 to 20 75	Southern Gray Forge	19 65 to 20 65
Local ScotchFdy.No.1	23 00 to 23 00	Southern Silveries	22 15 to 23 15
Local ScotchFdy.No.2	21 50 to 22 50	Jackson Co. Silveries	27 00 to 28 00
Southern Coke No. 1	21 40 to 22 40	Ohio StrongSofteners	24 10 to 24 60
Southern Coke No. 2	20 65 to 21 65	Alabama Car Wheel	26 00 to 26 50
Southern Coke No. 3	20 15 to 22 15	Malleable Bessemer	22 00 to 23 00

BARS.—A good steady business is about all that can be said of the demand for this material. An order for 3,000 tons was probably the largest placed in the week. It is difficult to obtain delivery on the heavy sizes of bars, both iron and steel, within four months, demand for these having been heavy in recent weeks. The price of iron is not steady. Some weeks sellers affirm that it is being maintained at 1.95c, and at other times, 1.80c to 1.85c is the ruling quotation. Only on special brands and very small orders is the higher price realized. We quote Chicago delivery, Bessemer steel, 1.75c to 1.85c; angles, less than 3x3, 1.85c; iron 1.80c to 1.95c; hoops, 2.05c. Prices out of store, steel, 2c to 2.10c; iron, 2.20c to 2.25c; hoops, 2.40c to 2.45c; angles, 2.50c to 2.60c.

SHEETS.—There is quite an active demand for both light and heavy sizes, the latter predominating. Store trade is brisk. We quote No. 27 black, mill shipments, Chicago delivery, 3.15c to 3.25c; galvanized, 4.40c to 4.45c; out of store, No. 27 black, 3.35c to 3.50c; galvanized, 4.60c to 4.75c.

STRUCTURAL MATERIAL.—There has been a falling off in the sales of the current week, sellers looking for a quiet business this month. Most of the buying that has been done recently was for stock purposes, and as the majority of the yards in this city have covered for their wants for a year ahead, a lull is expected. We quote mill prices, as follows: Beams, 15 inches and under, 1.75c; 18 inches and over, 1.85c; structural angles, 3x3 to 6x6, 1.85c; angles, channels and tees, smaller than 3 inches, 1.85c base; plates, 1.75c. Prices on lots from store are based on the necessities of buyers and according to the size of order. Store prices vary from 2½ to 4 cents a pound.

BILLETS.—A few sales of foreign billets have been made, but the total tonnage amounts to very little. Domestic billets cannot be obtained in this market. Foreign billets are selling at $31.50 to $32 a ton.

RAILS AND TRACK SUPPLIES.—A number of large sales of standard sections were made in this city, the orders, however, going to Eastern mills of the United States Steel Corporation. Two outside Eastern companies represented in this market, report sales of 17,000 tons of heavy rails in the week just closed. The demand for track supplies keeps in proportion to that for rails, though deliveries cannot be obtained within several months. We quote heavy sections, $28; second quality, $27; light rails, 45 pounds, $34 to $35; 12 pounds, $40 to $41, with regular differentials for intermediate sizes; out of store, $45 to $50; splice bars, 2.25c; spikes, carload lots, 2.45c to 2.55c; track bolts 3½x¾, with square nuts, 3.05c per 100 pounds; with hexagon nuts, 3.20c with usual differentials for other sizes.

MERCHANT STEEL.—Demand has been light, due to the cause that mills are sold so far ahead that they are refusing additional orders. We quote mill shipments, Chicago delivery, as follows: Smooth finished tire steel, 1.95c to 2c; open-hearth spring steel, 2.65c to 2.75c; sleigh shoe, 1.75c to 1.80c, flat sizes; concave and convex, 2c; out of store, 2.15c; cutter shoe, 2.40c to 2.60c; machinery steel, 2.15c to 2.25c, base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.25c to 2.35c; out of stock, 3c to 3.10c; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots, 5 percent to 10 percent higher; cold rolled shafting, carload lots, 50 percent off, Chicago; less than carload lots, 45 percent off, Chicago.

CAST IRON PIPE.—Small orders are plentiful, though the total tonnage is not very large. We quote 4-inch water pipe, Chicago delivery, $35.75; 6-inch and larger, $33.75; gas pipe, $1 a ton higher.

MERCHANT PIPE.—There is little change to be noted from the conditions reported last week. The market continues quiet, and sales are generally for small lots and for stock purposes. Prices are as follows:

MERCHANT PIPE, RANDOM LENGTHS.
(Jobbers, Chicago Basing Discounts.)

	Black Per cent.	Galv. Per cent.
⅛ to ⅜ in. inclusive	58½	46½
¼ to 12 in. inclusive	65⅝	53⅝

(Consumers, Chicago Basing Discounts.)

⅛ to ⅜ in. inclusive	56½	43½
¼ to 12 in. inclusive	63½	50½

BOILER TUBES.

Steel.

	Per cent.
1 to 1½ in.	35
1¾ to 2½ in.	45
2¾ to 5 in.	55
6 to 13 in.	47½

Iron.

	Per cent.
1 to 1½ in.	35
1¾ to 2½ in.	31½
2¾ to 5 in.	43½

PLATES.—As mills are refusing to accept orders for delivery next year, trading is not of large proportions. The local plate mill has so large a tonnage on its books, that it expects to carry over considerable of it into next year. Store trade is ac-

tive. There is no change in prices. We quote mill prices, Chicago delivery: Tank steel, ¼-inch and heavier, 1.75c to 2.15c; flange steel, ¼-inch and heavier, 1.85c to 2.25c; from stock, tank steel, ¼-inch and heavier, 2.30c to 2.50c; 3-16, 2.40 to 2.60c; No. 8, 2.45c to 2.65c; flange steel, 2.50c to 2.60.

Wire and Wire Nails.—At a meeting of the independent manufacturers held in this city last week, it was decided to continue the present scale of prices. This is the dull season, and buying is not very brisk. We quote smooth wire, carloads, $2.15; painted barb wire, $2.75; galvanized barb wire in carload lots, $3.05; wire nails, carload lots, $2.20; staples, carload lots, $2.30; jobbers' prices to retailers, 5 cents higher than above for carload lots, and 10 cents higher for less than carload lots.

Coke.—There is still a marked stringency in this material, and sellers have no difficulty in obtaining their prices. Connellsville coke for spot delivery is held at $6.00 to $6.25 a ton. We quote 72-hour Connellsville foundry, $5.75; Virginia and West Virginian coke $5.25 to $5.75.

Old Material.—There is plenty of scrap being delivered in this city from railroads and country dealers, though mills are not buying heavily. The prices, however, are held firmly at the following quotations for gross tons:

Old iron rails	$24 00 to $24 50	Relaying rails	31 00 to 32 00
Old steel rails, long lengths	22 50 to 23 00	Old wheels	20 00 to 21 00
Old steel rails, short lengths	18 00 to 19 00	Heavy melting steel	17 50 to 18 00
		Mixed country steel	15 00 to 15 50

The following are selling prices per net ton:

No. 1 R. R. wrought	$20 00 to $20 50	Steel axles	$21 00 to $22 00
No. 2 R. R. wrought	18 50 to 19 00	Cast borings	9 50 to 10 00
Dealers' forge	16 00 to 17 00	Wrought turnings	13 50 to 14 00
No. 1 busheling	14 00 to 15 00	Iron axle turnings	14 00 to 14 10
No. 1 R. R. & mch. cast	14 50 to 15 00	Steel axle turnings	13 50 to 14 50
Railway malleable	15 50 to 16 50	Stove plates	11 00 to 11 50
Country malleable	14 00 to 14 50	Old iron splice bars	21 00 to 22 00
Iron axles	24 50 to 25 00		

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 Rose Building, August 6.

July broke all records in the amount of iron ore brought down, the total sent from all upper lake ports being 4,073,386 tons, while in July, 1901, 3,697,823 tons was brought down. June of this year with 3,751,696 tons was a record breaker up to that time, but last month exceeded it by 321,690 tons. The total shipped this year to August 1 is 12,973,219 as compared with 8,661,431 in the same period last year. If the present record breaking is continued to the close of the season, the total for the year will far exceed the usual estimate of 23,000,000 tons, and it is probable that that estimate will prove too low; but it is not anticipated that August and September will show as large an increase over those months of last year as have June and July over the corresponding months in 1901. Although the demand of the furnaces is larger than last year's by perhaps 3,000,000 tons, there would be difficulty in handling at the lower docks all the ore that might possibly be brought down. Vessel men, who are usually inclined to complain about the railroads, admit that the immense amount of ore brought down in July has been well handled by the railroads. It is believed in some quarters that 58 percent of the entire amount of ore to be brought down this year has now arrived and that there will be a big decrease shown in reports for August and September. Some sales of ore are being made daily and inquiries are frequent. The sale of the Republic mine is a certainty, although some shareholders may not surrender all they own, not because they are opposed to the sale to the Cambria Steel Co., but because they are willing to own some interest in the mine after the controlling interest changes.

Pig Iron.—Some foundry iron is now being sold for delivery as late as September next year; that is, orders are for six months beginning in the spring of 1903. Foundrymen, including some heavy buyers, are however, very cautious. Usually nowadays, a week begins with a flood of inquiries and the agent thinks he is about to be overwhelmed, but the same week closes with only moderate orders. Very little Bessemer iron is being sold in the Valleys. Prices are the same as last week's, the lower figures on foundry iron being for shipment in the first half of 1903 and the higher figures for deliveries in the first two or three months of the new year:

Bessemer	$21 75 to $22 25	Scotch No. 1	$22 25 to $22 75
No. 1 Strong F'dry	22 25 to 22 75	Scotch No. 2	21 75 to 22 75
No. 2 Strong F'dry	21 75 to 22 25	Gray forge, Valley	20 25 to 20 75
No. 3 Foundry	21 25 to 21 75	Lake Superior chare'l	23 00 to 24 00

Finished Material.—The very remarkable condition of the plate market is shown by the fact that this week 1,000 tons of plates and bars were sold for delivery after April. Several lots of 500 tons of bars were sold for delivery early next year. The demands of shipbuilders continue for structural material and plates. Prices of tank steel are still from 1.70c to 1.85c Cleveland, depending on the sellers and deliveries. The base price for bar iron is 1.80c Pittsburg and not much is heard of premiums. Sales out of store, Cleveland, are on a basis of 1.90c to 2c for iron and steel and the warehouses are doing a brisk business. We quote steel bars at 1.60c for Bessemer and 1.70c for open-hearth, Pittsburg. The pronounced weakness of sheets continues and a decline in price is now probable, but no change has yet taken place. We quote 2.10c to 2.15c Cleveland for 3-16-inch and heavier. Cleveland prices are on the following basis on mill sales of black sheets: No. 24, 2.90c to 3c; No. 26, 3c to 3.10c; No. 27, 3.10c to 3.20c; and the following prices out of stock: No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.55 to 2.70c; No. 16, 2.95c to 3c; No. 18, 3c to 3.15c; No. 20, 3.05c to 3.20c; Nos. 22-24, 3.15c to 3.30c; Nos. 22-26, 3.25c to 3.40c; No. 27, 3.35c to 3.50c; No. 28, 3.45c to 3.60c, for one pass cold rolled. On galvanized sheets Cleveland prices to consumers are as follows for carload lots; Nos. 10 and 11, 3.15c; Nos. 12 to 14, 3.25c; Nos. 18 to 21, 3.55c; Nos. 22 to 24, 3.85c; No. 27, 4.53c; No. 28, 4.60c. We continue to quote 1.70c Cleveland for beams and channels for delivery in 1903, business for 1902 being through jobbers at prices from 2½ to 3½c according to sizes and quantity.

Old Material.—There was a fair demand for scrap the past week and a tendency upward, especially in prices of No. 1 railroad wrought scrap, wrought turnings, cast borings, steel boiler plates and malleable iron. We revise Cleveland prices as follows, all for gross tons:

Old iron rails	$ 26 00 to 27 00
Old steel rails (6 ft. and over)	22 00 to 23 00
Old steel rails (6 ft. and under)	20 00 to 21 00
Old car wheels	19 50 to 20 00
No. 1 R. R. wrought scrap	22 00 to 23 00
Mill scrap	20 00 to 20 50
No. 1 machine cast scrap	18 00 to 19 00
Iron axles	28 00 to 29 00
Axle turnings	18 00 to 18 50
Wrought turnings (free from cast)	15 50 to 16 00
Cast borings	11 00 to 11 50
Uncut wrought iron boilers	11 00 to 12 00
Steel boiler plates	18 00 to 19 00
Grate bars	11 50 to 12 50
Pipes and flues (clean)	17 00 to 18 00
Tank iron	17 00 to 18 00
Hoop and band iron	13 50 to 14 50
Sheet iron	11 50 to 12 00
Wrought drillings	14 50 to 15 00
Malleable iron	18 50 to 19 50
Stove plate	13 00 to 14 00
Heavy steel	19 00 to 20 00

CINCINNATI.

August 5.

There has been little if any change in the iron trade during the past week, conditions having remained satisfactory from the standpoint of the buyer and seller as well. The only trouble seems to be in the slowness of deliveries of finished material. There is some attention being paid to the matter of contracts for castings by big machinery concerns and the foundrymen. Most of the machine tool people have contracts based on the price of pig iron which are arranged according to a sliding scale. Some consumers of castings, however, prefer to make their contracts at a certain price for the year and it is on these contracts that the foundrymen have been having some trouble. It has been a hard matter to decide whether the price of iron for early delivery or delivery during next year should be taken as the basis for these contracts. The foundrymen naturally hold that the price of pig iron at the present time should form the basis for their charge while the consumers hold that on contracts running far ahead the price of iron for future delivery ought to rule.

Furnaces are in general operation in the South now and in the Hanging Rock district; and in the district that has to rely on the Pocahontas fields for coke there is a better supply of fuel with which to operate.

Pig Iron.—There has been a good aggregate of business in pig iron during the past week. Agencies of large Southern producers have been receiving orders for 6,000 to 10,000 tons

of iron daily. This iron is nearly all for delivery during the first half of 1903, there being little spot iron offered by any of the producers. There is a good demand for spot iron, however, coming from every variety of consumers. All the spot iron obtainable consists of a few odd lots, in some cases of off grades, that the furnaces have on hand or make beyond what is required to fill orders. Some of this iron has been sold as high as $22.25 for No. 2, Birmingham. Prices are about as they were last week, $17 ruling as the minimum for No. 2 foundry, Birmingham. There has been an advance by some of the Northern furnaces of $1 a ton owing to heavy sales. Prices at Cincinnati are quotable as below, this being on iron for delivery during the first half of 1903. Prices of iron for immediate delivery are all the way from $1 to $2 higher:

Southern Fdy. No. 1	$20 25 to 21 75	Gray Forge	$19 00 to 20 00
" " 2	19 75 to 21 25	Northern Fdy. No. 1	25 10 to 26 60
" " 3	19 25 to 20 75	" " 2	24 10 to 26 10
" " 4	18 75 to 20 25	Southern C. W. iron	25 25 to 25 75
So. Fdy. No. 1 soft	20 25 to 21 75	Malleable coke iron	22 75 to 23 50
So. Fdy. No. 2 soft	19 75 to 20 75		

FINISHED MATERIAL.—The demand is good and some of the manufacturing lines that have been rather slack during the summer so far are now making inquiries for material to be delivered well in the future. They find no apparent falling off in the demand and believe that unless they cover their wants as soon as possible they will not be in a position to get what material they need when they have to have it. It is expected that with the beginning of the fall there will be picking up of business in all quarters. Prices remain unchanged, bar iron being quoted at 1.92c and steel bars at 1.72c, both being quoted at 2.20c out of store. Angles are 2.35c and 2.50c out of store. Sheets are quoted at 2.50c for No. 12 and 2.35c for No. 10.

OLD MATERIAL.—Scrap iron has been in moderate demand. It has been the occasion of remark that the market for old material has been rather quiet for a considerable length of time and this in spite of the fact that the demand for pig iron of all kinds has been exceedingly good. The large scrap iron men say that it is because there is a rather small supply of scrap iron offered on the market. Prices remain as follows:

Old No 1. Wrought Railroad, net tons	$ 20 50 to 21 00
Cast Machine and Foundry, net tons	14 50 to 15 00
Old Iron Rails, gross tons	25 00
Old Steel Rails, gross tons	24 00
Old Short Lengths, gross tons	17 50 to 18 00
Old Iron Axles, gross tons	26 75 to 27 00
Old Iron Car Wheels, gross tons	19 50 to 20 00
Stove Plates, gross tons	11 00 to 11 25
Wrought Turnings, net tons	14 50 to 15 00
Cast Borings, net tons	9 50 to 9 75

NEW YORK.

OFFICE OF *The Iron Trade Review*.
ROOM 1909, NO. 150 NASSAU ST., August 5.

PIG IRON.—The pig iron market in this vicinity during the past week underwent but little change. Sales for the first six months of the year are being made with regularity. In some quarters the information is that buying for 1903 has eased up a little. The activity in Southern No. 2 iron is still marked. One of the largest Southern interests notified its sales agent here not to take any more orders for the first six months of next year, until further notice. Half the output of this company for the first six months is still unsold, but it wishes to furnace. Sellers report that it is not unusual to come across some who are very reluctant to buy at present prices, but who would not require much persuasion to buy if any concessions were made. For example, many sales of No. 2 Southern could be made at $16.50 at the furnace, but to such buyers $17 seems to be out of the question. Southern furnaces are fast getting back into good working order, and by a week no difficulties in operation will exist. In Northern irons the sales for next year are good, the prevailing price at the furnace being $21.50.

Some spot iron offered during the week, the majority of it, No. 1 Northern, commanded as high as $27, and it was quickly taken. Shipments of foreign irons are reaching here in good quantities weekly. Many complaints are still heard concerning them, especially to the effect that they are too high in silicon and phosphorus. Some favorable developments from the strike in the anthracite region are expected in the near future. In Wall Street yesterday the "coal stocks" showed great strength on reports that the strike is nearer settlement than at any time in weeks. New York prices for summer delivery are as follows: No. 1 X Northern, $23.50 to $25; No. 2 X Northern, $22.75 to $23.50; No. 2 plain Northern, $22.25 to $22.50; No. 1 foundry Southern, $22 to $23; No. 2 foundry Southern, $21.75 to $22.50; No. 3 Southern foundry, $21.25 to $22.75; No. 4 Southern foundry, $20.75 to $21.25.

FINISHED IRON AND STEEL.—The market for structural material is still characterized by great buoyancy. The closing weeks of the summer season are being marked by particular anxiety on the part of those who want shapes to get them in good time. Expectations are that present premiums for spot delivery, already high, will go higher. While structural material is still being sought abroad, the opinion is that the tonnage coming in has very little bearing on the scarcity which prevails. In sheared steel plates activity is noted on all sides, with the demand from bridge and ship building centers especially brisk. Sheets show more evidences of weakness. During the week several small jobbers sent out postal cards announcing offerings below current prices. The large jobbers, however, have announced no reductions. New York prices are as follows: Beams and channels, 15 inches and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees, 1.75c to 1.95c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 2.10c to 2.15c; flange, 2.25c to 2.30c; firebox, 2.30c to 3.50c; refined iron bars, 1.95c to 2c; soft steel bars, 1.95c to 2.10c. Sheets in car load lots, New York, No. 28, black, 3.18c to 3.25c; galvanized, 70, 10 and 2½ off.

PHILADELPHIA.

August 5.

Steel is easier this week, light sheets are less active and the pig iron market for 1903 is not so strong. Some consumers argue that present quotations for pig iron will hardly be maintained next year, on account of the large importations and because production will be increased considerably as soon as the coal strike is settled. The easier feeling in steel is no doubt due to the large offerings from abroad. Billets can be laid down at Atlantic ports at $29. On the whole, it may be said that while there is a splendid prospect for a large volume of business, present prices for early delivery are not likely to be maintained.

PIG IRON.—Pig iron for immediate shipment is as scarce as ever, prices for delivery in the last quarter are firm and there is considerable irregularity for next year's business. Lower prices are not expected this year, but July and August will show larger importations than June. Sales are being made at about the following prices for next year's deliveries: No. 1 X foundry, $23 to $24; No. 2 X foundry, $22 to $22.50; No. 2 plain, $21 to $22; standard grey forge, $20 to $20.50. For early delivery No. 3 Middlesboro is quoted $21 to $21.50; Scotch irons, $22.50 to $23.50.

FINISHED MATERIAL.—There is no especially new feature in finished materials. Plates are active and firm, structural material scarce. Prices are about as follows: Refined bar iron, 1.95c to 2c; soft steel bars, 2c to 2.10c; plates, ¼ inch and thicker, 2c to $2.10c; beams, channels, angles, 2.50c to 3c.

OLD MATERIAL.—The market is not active. A buyer who needs material is compelled to pay full prices, which remain about as follows: Old steel rails, $21 to $21.50; heavy steel scrap, $21 to $21.50; low phosphorus scrap, $27.50 to $28.25; old steel axles, $27.50 to $28.50; old iron axles, $29 to $30; old iron rails, $25 to $26; old car wheels, $20.50 to $21.50; choice scrap railroad No. 1 wrought, $23 to $24; country scrap, $18.75 to $19.75; machinery cast, $18.50 to $19; No. 2 light scrap, forge, $18 to $19; No. 2 light scrap, ordinary, $15.50 to $16.50; wrought turnings, $16.50 to $18; wrought turnings, choice heavy, $18.50 to $19; cast borings, $10.50 to $11; stove plate, $13.75 to $14.50.

The Vandegrift Coupling Co., heretofore of Indianapolis, announces its removal to Evansville, Ind. At the latter point is a shovel handle factory in which the company is interested, and the facilities for getting timber are special. The Vandegrift works are being equipped with improved high grade machine tools.

The Chicago Wire Fence & Tool Co., of Chicago, has been incorporated with a capital of $35,000.

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G. H. GARDNER, President and Treasurer.
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A. I. FINDLEY, Secretary.

A. I. FINDLEY, - - - - - - - - - - - EDITOR.
ROBERT I. CLEGG, - - EDITOR MACHINERY DEPARTMENT.
GEORGE SMART, - - - - - - - ASSOCIATE EDITOR.

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A YEAR'S FOREIGN TRADE IN IRON AND STEEL.

An export tonnage of iron and steel products less than one-half that for the preceding twelve months is the story told in the publication just made by the bureau of statistics for the fiscal year ending June 30, 1902. The falling off in values, owing to the high level of prices in the past year, has not been so pronounced. The following statement shows at a glance the fluctuations in the appraised valuations of iron and steel exports, apart from ore and including machinery, in the past five years:

Year ending June 30, 1898	$ 70,406,885
Year ending June 30, 1899	93,716,031
Year ending June 30, 1900	121,913,548
Year ending June 30, 1901	117,319,270
Year ending June 30, 1902	98,552,562

But tonnage comparisons give better information than values. In the table below is given a statement in gross tons of the exports of iron and steel in the past three fiscal years. For the fiscal year ending June 30, 1899, the total of the same items was 1,026,234 tons. The fiscal year 1902 thus had exports of less than half the average of the three years preceding:

EXPORTS OF IRON AND STEEL FROM THE UNITED STATES FOR 12 MONTHS ENDING JUNE 30—GROSS TONS.

	1900	1901	1902
Ferro-manganese	16	16	.....
Pig iron	160,674	255,237	54,704
Scrap	48,110	32,750	13,496
Bar iron	8,240	23,700	20,121
Wire rods	11,598	9,217	12,253
Steel bars (not wire rods)	32,623	76,424	14,686
Iron rails	6,149	1,290	640
Steel rails	341,646	373,688	166,816
Billets, ingots and blooms	14,084	121,136	2,907
Hoop, band and scroll iron	1,316	3,677	1,741
Iron sheets and plates	8,117	8,104	4,253
Steel sheets and plates	35,502	48,384	12,724
Tin plates, terne plates, etc	143	610	1,074
Structural material	56,265	64,820	61,190
Wire	105,747	73,608	99,640
Cut nails	11,132	11,586	6,860
Wire nails	37,784	19,916	20,722
Other nails, including tacks	1,916	1,821	1,834
Totals	881,062	1,125,984	495,761
Iron ore	40,510	60,717	68,265

The comparative table of values of machinery and of other products of iron and steel not specified in the above table is as follows:

VALUE OF IRON AND STEEL EXPORTS.

	1900.	1901.	1902.
Car wheels	$ 166,829	$ 203,396	$ 156,388
Miscellaneous castings	1,573,724	1,135,453	1,472,264
Cutlery, table	90,500	33,647	46,062
Other cutlery	205,712	200,640	211,966
Firearms	1,403,915	958,324	937,081
Builders' hdwr., locks, etc.	5,914,489	5,569,903	5,938,156
Saws	267,038	327,859	319,464
Other tools	3,464,490	3,306,751	3,586,482
Cash registers	813,077	873,121	1,144,062
Electrical machinery	4,328,917	5,812,715	5,379,746
Laundry machinery	441,592	479,274	536,716
Metal working machinery	7,193,390	4,054,313	2,977,290
Printing presses	1,219,774	1,005,929	808,943
Pumps and pumping mchy	3,108,279	2,187,246	2,159,999
Sewing machines	4,540,842	4,095,663	4,022,697
Shoe machinery	1,163,265	953,898	966,582
Fire engines	14,915	23,370	28,956
Locomotives	5,592,403	4,039,006	3,257,894
Stationary engines	652,976	901,888	709,975
Engine parts and boilers	1,756,199	1,086,385	1,791,062
Typewriting machines	2,697,544	2,827,329	3,302,191
All other machinery	21,913,202	20,864,352	20,505,421
Pipes and fittings	7,024,888	5,139,895	5,153,080
Safes	149,637	112,068	156,860
Scales and balances	535,932	532,640	517,758
Stoves and ranges	535,385	548,716	811,836
All other manufactures of iron and steel	15,322,922	15,459,441	12,749,284

The table of imports, as was to be expected, exhibits a marked increase in values. In tonnage the noteworthy increases are in pig iron, scrap, steel, and tin plates. The advance in import values was nearly $10,000,000:

IMPORTS OF IRON AND STEEL.

	1900	1901	1902
Total value, exclusive of ore	$20,476,524	$17,853,894	$27,180,255
Iron ore, gross tons	946,194	771,457	1,189,732
Pig iron, gross tons	61,100	39,325	158,961
Scrap iron, gross tons	28,185	20,414	49,188
Bar iron, gross tons	21,315	17,744	22,281
Steel rails, gross tons	2,487	1,091	15,017
Hoops and bands, gross tons	6,824	343	5,233
Steel ingots, billets, gr. tons	14,251	8,846	90,426
Sheets and plates, gr. tons	10,519	2,147	8,022
Tin plates, gross tons	66,034	52,625	88,337
Wire rods, gross tons	21,033	18,566	17,181
Wire and wire articles, gr. tons	1,808	2,824	4,225
Anvils, gross tons	259	234	200
Chains, gross tons	285	143	294
Cutlery, value	1,534,348	1,596,501	1,706,454
Files and rasps, value	59,709	59,776	72,293
Firearms, value	838,528	924,447	1,155,086
Needles, value	367,587	382,985	408,973
Machinery, value	3,568,973	3,324,786	3,643,393
Shotgun barrels, value	182,906	265,276	282,979
All other iron mfrs, value	1,671,694	1,570,269	2,349,516

The iron ore imports rose from 771,457 tons in 1901 to 1,189,732 tons, or more than 50 percent.

THE TIN PLATE WORKERS' DECISION.

One argument—and only one—is put forth by tin workers of the Amalgamated Association of Iron, Steel and Tin Workers, for their rejection of the proposition providing for a reduction in wages of 25 percent on tin plate manufactured in the mills of the American Tin Plate Co. to replace rebate tin plate now imported. This was that its acceptance would result in lower wages on all tin plate at some future time. None explained their reason for such belief, but it is no doubt the result of the general distrust of the employe for his employer. The tin workers had no reason to believe that the American Tin Plate Co. would not carry out its agreement to the letter. Since the organization of that company every agreement entered into with the Amalgamated Association has been faithfully kept, but the same cannot be said of the association's performance of

contracts. One year ago the Amalgamated Association violated its agreement with the American Tin Plate Co., and after the smoke of the battle had cleared and it was found that the Amalgamated Association was defeated, the American Tin Plate Co., in spite of its experience with that organization, consented to enter into another wage arrangement. Still the tin workers show a lack of faith.

An analysis of the vote shows that the men employed in the mills that have operated steadily were almost a unit against the proposition. On the other hand, the workers in the smaller mills that have been shut down from time to time favored it, believing that with additional orders they would receive more regular employment. It is a striking commentary on the solidarity and fraternalism which in theory are the commendable features of trades unionism, and which have been well exemplified by some organizations. Nor is this the only instance in which the prosperous and highly paid tin plate workers have passed by an opportunity to ease up the condition of their less fortunate brothers. Two years ago, when many of the smaller mills were closed, the American Tin Plate Co. gave permission to those unemployed to form floating crews and thus enable them to get a few days employment each week in the mills in operation. This was done, despite the danger of breakage and other losses certain to result from the operation of a mill by new though experienced hands. There were few of the tin workers who were found willing to give up their mills for a day or two a week.

It is not to be expected that American manufacturers of tin plate will always stand by and see orders for 1,500,000 boxes of tin plate a year go to Welsh mills Had the arrangement which had the sanction of the Amalgamated Association's officers been accepted this trade would have been immediately available to increase the output of American iron mines, blast furnaces, steel works and rolling mills, and several hundred thousand tons a year would have been added to the traffic of our railroads. Employment would have been provided through it to tens of thousands of American workmen. The negative vote of the tin plate workers will only hasten the perfection of machinery and the more general adoption of a system of production that in time will loosen the grip of the high salaried workers upon the tin plate trade, and remove ail limitations they have set upon output. The officers of the Amalgamated Association, who had computed that liberal earnings would still be possible to the workmen through the steady operation of tin plate mills, have been maligned and charged with all manner of recreancy for the stand they have taken, should be credited with a sincere effort to meet a condition. But a wage reduction in a time of prosperity did not commend itself to the favor of the workers. They failed to grasp the fact that the tariff on tin plates that makes it possible for them to earn double the wage paid in a Welsh mill, only passed Congress because of this rebate concession which the self-same tariff act made to the exporters of oil and canned food products. It is vain for the Amalgamated Association to hope for the elimination of the drawback from the Dingley tariff. If these imports of tin plate are to be stopped it must be by some method that will give the exporters of canned goods as low a price as that they are now paying. The solution of this problem the tin mill workers have now referred back to the manufacturers.

CORROSION OF STEEL IN TALL BUILDINGS.

A radical change in the design of steel skeleton buildings in the thickly populated centers of the country is anticipated in the near future by architects and engineers who design and erect such structures. While tall buildings are a development of quite recent years some very grave defects have already been found in the steel work where columns and girders have been laid bare for inspection. Too little care has been taken to prevent oxidization and corrosion, and nearly all the steel work thus far examined has shown the action of destructive elements. Only recently an examination was made in an Eastern city of the steel work of a large building erected about 10 years ago, and all the foundation columns were found to be in a dangerously bad state. One of the columns, more exposed to corroding influences than the rest, had to be replaced and others were reinforced.

Such revelations will certainly lead to new designs for such structures. The steel work will either have to be encased in cement to prevent the attack of destructive elements on the more exposed portions will have to be so built as to make frequent inspection easy, as well as the application of material to prevent corrosion. The system of plumbing will have to be changed so that none of the pipes carrying water or steam will come in contact with the steel work in any way, as leaks often greatly impair the steel work before being discovered.

Many architects have been extremely careless in designing steel structures, and today the foundation columns of many large buildings are constantly exposed to the action of water and other corroding agents that will destroy the steel in a very short time.

GROWING IMPORTS OF PIG IRON AND STEEL.

The statistics of imports of iron and steel for June, as compared with those for June of last year, show more markedly than those for preceding months how the scarcity of material at home has increased the demand for foreign products. The imports of pig iron in June, 1901, were 6,113 tons, while for June, 1902, they were 32,458 tons. Imports of scrap increased from 1,964 tons to 12,760 tons; steel rails from 110 tons to 5,931 tons, while the imports of slabs, billets, bars, and structural material (which are included in a single item) jumped from 745 tons to 35,587 tons. Tin and terne plate imports in June, 1901, were 3,650 tons and in June, 1902, they were 5,817 tons. The imports of iron ore remained about the same, being 92,924 tons in 1901 and 91,956 tons in 1902. The table below shows how the pig iron and steel imports have grown since January:

IMPORTS OF IRON AND STEEL—GROSS TONS.

1902.	Pig Iron.	Steel.
January	7,883	5,313
February	8,307	2,235
March	17,184	6,570
April	19,067	11,986
May	30,708	24,388
June	32,458	35,588
Six months	115,607	86,080

In exports, the most noticeable decrease was in steel rails, which fell from 31,515 tons in June, 1901, to 7,507 tons in June, 1902. Exports of structural iron and steel decreased from 4,599 tons in 1901 to 1,784 tons in 1902. Exports of tin and terne plates increased from 10 tons to 255 tons.

The Machinery and Metal Working Trades—News Letters from Selling Centers.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1909, No. 150 NASSAU ST., Aug. 5.

On all sides satisfaction is expressed with recent developments in the machinery market in this vicinity. With the advent of July the general opinion was that it would be marked by the usual summer dullness. The first few days looked as if this would be so, but the balance of the month found trade exceptionally good. Many houses say it was the best July they have ever known. Inquiries made their appearance in large numbers, and sales followed as a general result bettter than usual.

In giving an explanation of this unusual state of affairs some firms are disposed to attribute it to the weather which being free from the oppressive heat usual in July has permitted full operation of manufacturing plants. Others reason that it was only natural for trade to be good in view of the favorable crop prospects and the good reports from all branches of business, especially manufacturing lines. The opinion is expressed that many have not yet formed a proper conception of the industrial development of the country that is going on about them. Much interest has been shown during the month in the probable effect of recent advances in machine tools. Results so far are on the side of those who advocated the increases. While previous to the advances there were a large number of inquiries out for machine tools, not one of these, so far as can be learned, was withdrawn when the increased prices went into effect. The point is made by sellers that where a purchaser is in need of a lathe, planer, or any other kind of a machine tool, he is not going to allow a 5 or 10 percent increase in the price to stop him.

One of the men who takes no stock in the adverse comments first expressed on the increased prices—and they were then not hard to find—is connected with an important machinery selling firm. "I am decidedly of the opinion," he said to a representative of *The Iron Trade Review*, "that these advances were no more than proper. Everybody knows that the price of raw material has gone up, and that castings cost more also. I say everybody knows these things, but there is another thing overlooked, and whose bearing on the propriety of the advances must not be considered lightly. I refer to the increased cost per unit of output. There isn't a machine tool plant you can name that can give as good an account of itself in this direction as it could several years ago. The reason of it is that the men employed get higher wages than they did several years ago, and yet they work fewer hours. Then you must remember that no advances have been made in machinery since we had the dull times. But apart from what I have stated is the self-evident fact that if a man needs a machine tool he is going to buy it, even if the price has been raised 5 or 10 percent." Asked for his opinion as to the probable outlook for trade, the speaker said:

"I think it is all that can be expected. Present conditions are of the best. During July, for example, our house submitted more bids for machine tools than it has in the same time in all the 16 years it has been in existence. There is only one cloud on the horizon, and that is labor troubles. Much as we have reason to rejoice over our present industrial prosperity, we would have still greater reason to rejoice if the relations between capital and labor were a little more cordial than at present. Only a few days ago, I received a letter from a large capitalist in London, in answer to one I had sent him urging him to invest in a certain new industrial enterprise. He wrote me stating that he fully agreed with me in the assurances I gave him concerning it, but he was unwilling to invest his money in any enterprise that had a labor yoke to it. Once establish the fact that capital and labor have interests in common, and that discord is destructive of the best that is in both, and the industrial prosperity that will follow in this country will be the greatest it has ever known."

The foreign machinery trade still continues at a low ebb. One effect of the increased prices in machine tools has been to curtail the sale abroad. The claim is made by foreign buyers that they can buy across the water cheaper than here and that deliveries by foreign makers are more prompt. At the same time the superiority of American tools is recognized.

Government advices are that purchases of machine tools for the present fiscal year, which began July 1, will be on a larger scale than ever before. New construction of good proportions is expected at the various navy yards, particularly in Brooklyn.

The Prentiss Tool & Supply Co., of 115 Liberty St., made some large sales of milling machines and drills recently. They report their July business to have been better than that for June.

The Birmingham Machine & Foundry Co., of Birmingham, Ala., has received, through its New York office at No. 120 Liberty St., an order for all the machinery to be used in five new sugar refineries in Puerto Rico. The order aggregates $74,000. The company is also making good shipments of sugar machinery to Mexico.

Paul Bigelow, of 39 Cortlandt St., representing the Buckeye Engine Co., of Salem, O., has received an order for two 770-h. p. vertical engines for installation in the Portsmouth Navy Yard, Portsmouth, N. H.

The American Machinery & Export Co., of 120 Liberty St., has received a substantial order for several machine tools from the Wellington & Manawafa Railroad, of Wellington, New Zealand.

Edwin H. Ludeman, of No. 39 Cortlandt St., New York agent for the Fitchburg Steam Engine Co., Fitchburg, Mass., has placed the following orders: One 750-h. p. cross compound railway type engine, Elmira Water, Light & Railroad Co., Elmira, N. Y.; one 450-h. p. tandem compound engine, John Stevenson Car Works, Elizabeth, N. J.; one 125-h. p. engine, Rossie Velvet Co., Mystic, Conn.; and one 100-h. p. engine, Manhattan Silk Co., Ogdensburgh, N. Y.

James Leffel & Co., of Springfield, O., with offices at No. 120 Liberty St., have received an order for 20 small boilers for use in oil refineries in Texas.

E. P. Reichhelm & Co., of 23 John St., will install a complete fuel gas plant in the works of the Gorham Mfg. Co., Providence, R. I.

The Thayer & Co., Ltd., of No. 39 Cortlandt St., received some very good orders for steam boilers during July.

Peter Frasse & Co., of No. 94 Fulton St., who make a specialty of machinists' supplies, report that all branches of these have been in good demand recently.

The New York office of the Niles-Bement-Pond Co., 136 Liberty St., reports a very satisfactory business for July. One of the large orders received was for 16 cranes, ranging from 5 to 30-ton sizes, for installation in the new plant of the International Steam Pump Co., at Harrison, N. J. Another large order was from the New York Central Railroad Co. for $25,000 worth of tools for use in its shops at Oak Grove, Pa.

The General Electric Co., of Schenectady, N. Y., is making extensive additions to its plant, and has been a large buyer of machine tools recently. Its purchases, which have been fairly well distributed, are estimated to be in the neighborhood of $40,000.

The branch office of Hill, Clarke & Co., at Liberty and Greenwich Sts., is in receipt of some good orders, particularly of the new machines which the company is introducing.

M. H. Treadwell & Co., 95 Liberty St., have been given the order for the 600 tons of iron castings to be used on the Newton Creek bridge, Brooklyn. The Allis-Chalmers Co. has given them an order for 12 engine housings, weighing 20 tons each, and the Sharon Steel Co., of Sharon, Pa., an order for five cinder cars.

Hoover, Owens & Rentschler Co., of 39 Cortlandt St., have received an order for a 600-h. p. horizontal Corliss engine, from the Stewart Iron Co., Sharon, Pa., and an order for a 200-h. p. engine from the C. B. Coles & Sons Co., Camden, N. J.

The Exeter Machine Works, at 120 Liberty St., will supply the complete mechanical equipment for the Lowtha Bros.' coal pocket at 32d St. and East River, New York. The order will aggregate $25,000.

The Binsse Machine Co., of Newark, N. J., has received an order for six horizontal boring mills from the Pennsylvania Railroad Co., for installation in its various shops.

The Farrel Foundry & Machine Co., of 26 Cortlandt St., has received some good orders for machinery for use in new sugar mills in course of erection in Puerto Rico and Cuba.

CLEVELAND.

OFFICE OF *The Iron Trade Review*, }
1064 ROSE BUILDING, Aug. 6. }

July and August are unusually dull months for dealers in machine tools and supplies and there has been a slight decrease in business the past month as compared with June, but the business for July has been larger with almost all dealers this year than last. The fact that this is true, in spite of the advance of 10 percent in prices of nearly all tools is strong evidence that the prevailing prosperity is being fully enjoyed by dealers in this line.

The general prosperity of Cleveland manufacturers is shown by the making of numerous additions and the prospect that still further enlargement of plants will be necessary. Some manufacturers who did not buy far in advance are having considerable difficulty in getting material.

Joseph Dyson & Sons, manufacturers of forgings, are doing a large business in forgings for automobiles. They have recently had a great deal of trouble getting billets and have ordered a large supply from England.

The Variety Iron Works are about to begin work on contracts for the new blast furnaces in Toledo and Cleveland.

The Elwell-Parker Electric Co. has recently had a gratifying increase of business, especially in the sale of hoisting motors, in direct connected generators for lighting and power and in mill motors. Among recent sales are the following: Six motors, each capable of doing 130-horsepower, that are approaching completion, for the St. Clair Steel Co., Pittsburg; five large motors for the pumping and blowing plant of the Patterson & Passaic Gas & Electric Co., Patterson, N. J.; to the Brown Hoisting Machinery Co., two direct connected engine type generators that have a capacity of 250 kilowatts each; to the Alliance Machine Co., Alliance, O., a complete equipment consisting of 100 horsepower generator and engine direct connected, with five 25-horsepower motors; to the Niles Tool Works Co., three motors for driving machine tools, for the Alliance Machine Co.

The Cleveland Twist Drill Co. has just completed a fire extinguishing plant which is in harmony with the rest of the appointments of this up to date company. The tank holds 75,000 gallons of water and there is a Knowles pump with a capacity of 750 gallons per minute, or about as much as three ordinary hose of a fire department.

The C. O. Bartlett & Snow Co., Cleveland, has moved from Center St. to a block on the "flats" bounded by French, German, Fall and Winter Sts., having purchased the property 425x410 feet, from the Viaduct Turning Co. and the Klosterman-Young Co. Several additions have been built, a sidetrack from the Big Four R. R. has been laid through the main building and a lot of new equipment including an Ingersoll-Sergeant compressor has been installed. The company is preparing to use coal dust as fuel, believing that 30 percent will be saved in the amount of fuel used, that 20 percent less boiler power will be required and that no smoke will escape. The coal is thoroughly crushed before being put into the furnace. The company manufactures mill and conveying machinery and has a large foreign trade, especially in Russia and South American countries.

Bishop & Babcock, proprietors of the Cleveland Manufacturing Co. and the Cleveland Tack Works, have erected and equipped a new power house, 50x60 feet, with stack 110 feet. There are two boilers and a Westinghouse generator. The plant is now run by electricity throughout.

The Kirk-Latty Mfg. Co. which makes bolts, nuts and tacks and has recently absorbed the Metal Goods Mfg. Co., is preparing to double the capacity of its plant. Another story is being added to the main building, 275x50 feet, in which bolts are made, a new blacksmith shop, 100x50 will be built, a new building 150x50 will be added for the wagon department and an addition will also be made to the office building, doubling its space. This company, although organized in recent years, has grown rapidly and is doing a large business. Numerous new machines of the company's make are found in the bolt department.

The Cleveland Twist Drill Co. has now been operating its dining room for employes for several years and in spite of the fact that the food is furnished at a loss, the officers of the company are more than pleased with the experiment. Most of the men esteem it a privilege to be able to get a hot meal well cooked in the middle of the day. As a temperance move the dining room is a success. Before it was established, many of the employes were in the habit of going to saloons and spending their money for beer at noon. The result was that some returned to their work with minds not in the most acute condition. This evil has been almost entirely overcome by the serving of coffee in the company's dining room. The reading room, where the best periodicals are found, continues to be well patronized and the piano is by no means forgotten. The employes are intelligent and industrious and appreciate the efforts of the company to add to their comfort.

The Globe Machine & Stamping Co. has increased its capacity considerably during the past month. A Fosdick & Holloway radial drill, a Pond planer, a Reed lathe with taper attachment, a Knecht sensitive drill press, a Steptoe shaper and a LeBlond universal miller with taper attachment have been put in. The company reports orders coming in very fast. Fred. G. Nicolyaus, formerly with the Browning Engineering Co. and later with the National Stove & Illuminating Co., has recently interested himself with the Globe Machine & Stamping Co. and is now its superintendent.

The Fraser Machine Works are at present finishing up one of their universal milling machines which will have greater capacity than any previous machine they have built. The table feed is 42 inches, and the weight of the machine about 4,000 pounds.

For the second time within a year, owing to increase of business, the Balkwill Pattern Works have been compelled to enlarge their plant. They now have twice as much room as they had a year ago. A number of the latest improved machines have recently been added to the equipment.

The Chisholm & Moore Mfg. Co. reports business in a most satisfactory condition, and orders coming in freely so that the company always has two or three months' work ahead on its books.

On account of increased business, the Edmonds Elevator Co. has added to its plant one triple gear 36-inch lathe and one 33-inch planer.

The Playford Stoker Co. is installing 2,000 horsepower stokers under 500 horsepower boiler units for the National Enameling & Stamping Co., at Granite City, Ia.

The Cleveland Pneumatic Tool Co. received bids this week for its new buildings at Hawthorne and Second Aves. and the contracts will be awarded in a few days.

The Parish & Bingham Co., manufacturer of cold pressed metal work, is making extensive improvements in its plant, the capacity of which will be largely increased.

The Cleveland Crane & Car Co. has finished moving to its new plant at Wickliffe, near Cleveland. Among recent shipments were two 25-ton cranes to Worth Bros. Co.'s steel works and plate mill, Coatesville, Pa., and one 30-ton crane to the Pittsburg, McKeesport & Connellsville R. R., Pittsburg.

The Chase Machine Co., Elm St., is building an automatic steam towing machine for the Newport News Ship Building & Dry Dock Co., which is the largest and heaviest machine of this kind ever constructed. It handles a steel wire towing hawser 2 inches in diameter. The increasing size of machines turned out by the Chase Machine Co., has compelled the company in the last few weeks to add a 7-foot planer, and a 94-inch swing lathe to its equipment.

At a meeting held a few days ago of Peck, Stow & Wilcox, at Southington, Ct., A. R. Treadway, L. H. Treadway and S. W. Sessions were elected to represent Cleveland interests as directors. A regular 2 percent quarterly dividend and a special dividend of 2 percent were declared. It is ex-

pected that the growing demands of the business will necessitate adding a new line of manufacture during the year.

The Atlas Car & Mfg. Co. is very busy with some large equipments of industrial railroads. The new plant of the Jessop Steel Co. will be furnished six different styles of cars, also the portable track, switches, and steel ties. The Atlas company is adding considerable new equipment to its machine shop, including a number of boring mills and lathes.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
934 MONADNOCK BLOCK, August 5.

During the past month manufacturers and dealers in machine tools have seen some of the midsummer dullness characteristic of nearly all the metal trades at the present time. This has probably been felt more strongly by dealers in second-hand machinery than by manufacturers, the trade of the former as a rule feeling quickly the change in seasons and in industrial conditions. There is nothing abnormal, however, in the decrease of sales, and the falling off has been rather welcomed because of the opportunity it gave to catch up on late orders. The majority of the manufacturers have had their capacity taken months ahead for some time and notwithstanding large extensions and improvements, completed and projected, are still unable to say when they will be able to deliver much of their business. South Canal Street dealers report that little business of large proportions has been closed in the past month, the orders generally being for odd tools of the smaller kind. The following is a summary of reports received from leading manufacturers in the Middle West.

Joseph T. Ryerson & Son, Chicago, say that the inquiries for heavy hydraulic and other machinery are far in excess of those at any time in the history of their business, and that the demand for light tools is excessive because of the fact that none of the kind which they handle can be purchased from second-hand dealers. In very small tools the same conditions apply, the makers constantly pleading for more time to deliver. Orders are being placed in great numbers and deliveries becoming more remote, the company advising all customers to send in specifications early if they wish the tools delivered in 1903. The following is a partial list of the concerns to whom they have sold machine tools in the past thirty days: East Jersey Pipe Co., Columbiana Boiler Co., Stillwell-Bierce & Smith Vaile Co., Holthoff Machinery Co., Topeka Steam Boiler Works, Raymond Bros., Galena Mill Supply & Iron Co., Gardner Governor Co., Standard Oil Co., C. B. & Q. R. R. Co., New Winona Mfg. Co., Vance Boiler Works, Rural Mail Box Co., Joliet Bridge & Iron Co.

Barnard & Leas Mfg. Co., Moline, Ill., reports that it has orders on its books sufficient to keep its plant running full time to the end of September and that new business is coming in every day. The company's machine shop and wood shop have been running twelve hours daily for some time, and even thus are hard pushed. The company manufactures flour mill and grain cleaning machinery, for which it is receiving a large number of orders from rice and cottonseed oil mills in the South. It also finds a good demand for its magnetic separator for foundry use.

Luther Brothers Co., Milwaukee, Wis., manufacturer of gas and gasoline engines, emery grinding machines, machine tools, etc., has recently closed a contract with the Carborundum Co., Niagara Falls, N. Y., for the exclusive use of its Carborundum diamond wheel on the former's hand power grinders. It reports that all its departments are full of work.

Union Drop Forge Co., Chicago, is still considerably behind in getting out its orders, notwithstanding the large additions to its equipment in the spring.

Charter Gas Engine Co., Sterling, Ill., is crowded on portable engines, which have been going to almost every State of the Union. Carloads of machines were sent recently to Texas, Massachusetts, California, Georgia, Iowa, Kansas and other points. Business with this company has been on the increase since the beginning of the year.

Whiting Foundry Equipment Co., Harvey, Ill., reports that the volume of business is satisfactory, a plentiful supply of orders constantly coming in, with numerous opportunities to figure on new work. The company recently purchased some punch and bender tools, boring machines, etc., and an electric traveling crane. It is also building an addition to its factory, increasing the floor space 12,000 square feet.

Gardner Governor Co., Quincy, Ill., says that business has been "super-fine" all summer, the demand for its machinery far exceeding the shop's capacity. The company has made large shipments of pumps to foreign countries and to the Texas oil fields. Its governors are being used by the largest engine builders in the country, and the air compressor which was recently placed on the market is meeting with good success. The company recently erected a new warehouse, but has not been able to accumulate any stock to store in it. New machinery and further extensions are contemplated.

Bass Foundry & Machine Co., Fort Wayne., Ind., is building for the American Tin Plate Co., to be installed in the plant at Elwood, Ind., a cross compound condensing Corliss engine, 30 and 50x60, also a 28 and 54x60 cross compound for the Laughlin works at Martin's Ferry, O. The Bass company is also building a 30x48 heavy duty rolling mill engine for the American Sheet Steel Co., for its plant at McKeesport, Pa.; also two 28x60 and one 28x48 heavy duty rolling mill engines with rope wheels, jack shafts and pillow blocks for the McKeesport Manufacturing Co., McKeesport, Pa. It has a contract with the Colorado Fuel & Iron Co., for two 24-foot and two 10-foot rope wheels, each grooved for 52-inch ropes. These will be built in four sections, each section in halves. Included in this contract are also jack shafts and pillow blocks.

Reeves Pulley Co., Columbus, Ind., reports a very active demand for their different lines of machinery. Among recent large shipments of wood split pulleys are metioned carload orders for London, South America, Seattle, Washington, Tyler, Texas, and for Milwaukee, New York and Boston. In the transmission line, it has taken a number of large paper mill orders in the last two weeks, and has all the business it can handle with any degree of prompt delivery.

Henry Voght Machine Co., Louisville, Ky., builder of ice and refrigerating machines, advises us that it is receiving an unusually large number of orders, and that the business outlook is very flattering. It has moved into its new plant, which covers 15¼ acres, eight of which will be under roof. Among the orders received are the following: J. M. Leach & Co., Kokomo, Ind., 25-ton machine (2d order); Massachusetts General Hospital, Boston, 10-ton refrigerating machine; J. P. Oertel, Louisville, Ky., 40-ton refrigerating machine (2d order); Paris Ice Mfg. Co., Paris, Ky., 12½-ton ice making machine; L. Stornebrink, Yokohama, Japan, 18-ton ice-making machine; Scranton-Murphy Ice Co., Weir City, Kansas, 15-ton ice making machine; Tandjong Penang Ice Co., Penang, British India, 15-ton ice making machine; Duquesne Ice Co., Pittsurg, two 75-ton ice making machines; Geo. L. Knopp, Cincinnati, O., 60-ton ice making machine; Central Asylum for Insane, Indianapolis, Ind., 16-ton refrigerating machine; Citizen's Ice & Cold Stor. Co., Owensboro, Ky., 20-ton ice making (2d order); Antlers Crystal Ice Co., Antlers, I. T., 5-ton ice making machine; Benj. J. Rohr, Louisville, Ky., 30-ton ice making machine; Southern Indiana Hospital for Insane, Evansville, Ind., 8-ton refrigerating machine; Indian River & Lake Worth Fish Co., Ft. Pierce, Fla., 10-ton ice making machine; Marianna Mfg. Co., Marianna, Fla., 10-ton ice making machine; S. H. Young, Chichigalpa, Nicaragua, C. A., 5-ton ice making machine; Lake & Johnson, Gibara, Cuba, 10-ton ice making machine (3d order); Simon Ice Mfg. Co., Louisville, Ky., 50-ton ice making machine (3d order); Marion Ice & Cold Storage Co., Marion O., 40-ton refrigerating machine.

A. L. Ide & Sons, Springfield, Ill., reports among recent sales of "Ideal" engines, the following: One 14x22x16 direct-connected, Northern Pacific Railroad, Livingston, Mont.; two 24x20, belted, Ashland Iron and Steel Co., Ashland, Wis.; one 18x16 direct connected, Manhattan Light, Heat and Power Co., St. Paul, Minn.; two 15x22x16 direct connected, Atchinson, Topeka & Santa Fe, Albuquerque, N. M.;

one 11x18x14, belted, Champion Copper Co., Painesdale, Mich.; one 11x18x14 direct connected, Bingham Consolidated Mining & Smelting Co., Salt Lake City, Utah; one 14x14, direct connected, Hecla Coal & Cement Co., Bay City, Mich.; one 15x14 belted, University of Wisconsin, Madison, Wis.; one, 13x22x16, direct connected, Michigan Alkali Co., Wyandotte, Mich.; two 13x12,, belted, Allis-Chalmers Co., Chicago, for Mexico; one 10x16x12, belted, Leland Stanford University, Palo Alto, Cal.; one 13x22x15, direct connected, Northwestern Malleable Iron Works, Milwaukee, Wis.; one 24x20, direct connected, Springfield Electric Light and Power Co., Springfield, Ill.; one 15x14, direct connected, Ludlow Saylor Wire Co., St. Louis, Mo.; three, 15x14 direct connected, Washington University, St. Louis, for Administration Buildings, World's Fair; two 13x12, direct connected, Wagner Electric Manufacturing Co., St. Louis.

Williams, White & Co., Moline, Ill., manufacturers of bulldozers, punches and shears, etc., report that in a general way they find business rushing. They are considerably behind orders in many lines, though in some makes of machines they are able to give fairly prompt deliveries. The are building a large machine shop extension, completely covered by electric cranes, and are installing a number of new tools. Orders in the shop at the present time include five large multiple punches and shears, three 1,000-pound board drop hammers, bulldozers, eye benders and power hammers.

Scully Steel & Iron Co., Chicago, is overwhelmed with orders for the class of machine tools which it handles. During the month of July, the following companies were sold: Minneapolis Steel & Machinery Co., Minneapolis, Minn.; Lima Locomotive & Machine Co., Lima, O.; F. R. Gustavus, Oshkosh, Wis.; Drake, Wilson Mount Co., Omaha, Neb.; George E. Laubenheimer Co., Chicago; F. G. Fernstrum, Menominee, Mich.; Walsh & Weidner Boiler Co., Chattanooga, Tenn.; Payne & Joubert, New Orleans, La.; Henry Pratt Boiler & Machine Co., Chicago; Great Northern Construction Co., Harvey, Ill.; J. C. Schneider, Winona, Minn.; Iowa Iron Works, Dubuque, Ia.; William Bros Boiler & Manufacturing Co., Minneapolis, Minn.; Manitowoc Steam Boiler Works, Manitowoc, Wis.; E. A. Ryan, Sisterville, W. Va.; Horn & Jennett Iron Works,, Chicago. Most of these tools were direct connected to motor.

Model Gas Engine Co., Auburn, Ind., says that its business has grown rapidly this year, the capacity having been more than doubled in this time. It is now turning out about 600 engines per annum, averaging about 10 horsepower in size, though the company is gradually getting into larger units, having recently installed several large electric lighting plants. The company's product goes from Maine to California, and it has branch offices in Texas and California, to both of which points it ships large quantities of engines.

Quincy Engine Works, Quincy, Ill., announces that it has completed its new plant and that it has orders on hand for the Williams compound engines which will keep the shops fully employed for some time.

Aetna Foundry & Machine Co., Springfield, Ill., manufacturer of engines, steam pumps and mining machinery, says that the demand for its new first motion hoisting engines is very encouraging. The company has all the orders it can handle without greatly increasing its plant, though it will probably do the latter should the demand continue.

Bignall & Keeler Mfg. Co., Edwardsville, Ill., manufacturer of pipe threading and cutting machines, states that it is exceedingly busy, its plant being taxed to the utmost. This is not due to any exceptionally large orders, but to a steady flow of small orders for single machines or for two or three machines from all parts of the country. The company look for a favorable business the balance of the year.

Cook Well Co., St. Louis, Mo., reports an active state of business in both well and supply departments. It has recently taken contracts for two 8-inch wells at Granite City, Ill., for the National Enameling and Stamping Co.; two 6-inch wells for the Pratt Cereal Co., Decatur, Ill.; one well for the Pfeiffer Milling Co., Lebanon; four 8-inch wells for an Indiana water works; four 10-inch wells, supplying 2,000,000 gallons daily, for the city of Collinsville, Ill.; seven, 6-inch horizontal or push wells, 400 feet each, under the Missouri river at Omaha; three 10-inch wells for the city of Bloomington, Ill., and many others. In addition, it has received orders for a complete pumping plant for the Pinnacle Coal & Coke Co., Mora, W. Va., and for five well strainers to go to Mt. Pleasant, N. Y.

New Doty Mfg. Co., Janesville, Wis., manufacturer of punching and shearing machinery, is adding to its plant a new pattern storage room, 40x70, three stories high; a new pattern shop, and an addition to its machine shop, 60x60. Business is excellent, the company having all it can do for some months in the future.

CINCINNATI.

August 5.

Manufacturers of machine tools say that the recent advances in prices have had no effect whatever on the demand for their products. From almost all parts of the country orders have been coming in for tools, and the purchasers seem to have no hesitation about paying the price that is asked. The notable feature about the business is that there is practically no foreign business whatever. The demand for tools to go to Europe is taken no account of by manufacturers in this city. An exception to this statement, however, might be made in the case of Canadian trade. There has been quite a run of business with concerns across the Canadian border, the people in the Dominion saying that the small capacity for manufacturing machine tools in their own borders has been overtaxed. There is a duty of 30 percent on machinery going into Canada and there certainly is a need of machinery if American product can be shipped in notwithstanding this high duty.

The question of the continuance of the present temporary arrangement for running the affairs of the National Metal Trades Association will probably be settled at a meeting to be held at Niagara Falls on August 19. The headquarters of the association are now in Cincinnati under E. F. DuBrul as commissioner. The matter of electing a permanent secretary will depend upon who is permanently made commissioner. It now looks as though Mr. DuBrul would continue as commissioner and this would mean that a Cincinnati man will be made secretary. In the meantime Robert Wuest is acting as secretary.

J. B. Doan, who was recently put in charge of the sales department of the American Tool Works Co., is doing good work for that concern. Its business for the past month or two has largely increased and it is understood that the management is exceedingly well pleased with the outlook for the year. It is intimated that the concern may remove its plant to the tract of land recently purchased by it in one of the suburbs.

The Belmer Machine Tool Co. is the successor of the Belmer-Eames Machine Tool Co. that was dissolved a short time ago, and the company is stated to be doing quite a large and satisfactory business in its specialties.

The Cincinnati Planer Co. today occupied the new addition to its plant by the operation of which it will secure about a third additional capacity.

The new foundry of J. H. Day & Co. is nearing completion and the firm will have enough capacity to take care of the large additional business.

The purchase by the J. A. Fay & Egan Co. of a tract of about 90 acres of land near Bond Hill, Cincinnati, may be followed by the location on that tract of a number of other machine tool concerns beside the Fay & Egan Co. itself. It is stated that the Fay & Egan Co. will not remove its plant to the new quarters until it has disposed of the property on which it is now located. This it expects to do in a short time. G. P. Altenberg, the foreign manager of the J. A. Fay & Egan Co., is now in Europe on his annual trip in the interests of his firm. Mr. Altenberg intends to go on to South Africa in order to establish agencies and appoint representatives there.

Cincinnati machine tool concerns will exhibit at the Fall Festival that is to open Sept. 15. Among them will be most of those that had exhibits at the festival last year.

The L. Schrieber & Sons Co. was awarded the contract last week for the iron work on the new Third National Bank Building on Fourth St. This building will be one of the most

attractive in the city since it will be distinctively a banking institution without accommodations for offices or anything save the rooms for the bank itself.

The Wm. Powell Co. has received an order for a large number of valves to go to the shops of the railway that is being built by Russia in Asia to connect the interior with the Russian sea coast.

It is understood that the Triumph Electric Co. is making arrangements for increasing its capital and extending its capacity to about double what it now has. The concern has recently secured some good orders for electrical equipment to go to South Africa.

PHILADELPHIA.

Aug. 5.

About the only change noticeable in the Philadelphia machinery market is the trifling laxity which comes as a matter of course in the summer months. It is attributable entirely to the time of year, and the fact that many heads of departments and employes are taking their vacations, as a rule all well earned, and all the more necessary this year on account of the extra amount of hustling which has devolved upon every man in machine building establishments for the past twelve months. The lull, if we may call it that, is entirely one sided, and is merely a breathing spell on the side of supply. It is worthy of note that inquiries were never more prolific than during July, and bookings never more satisfactory. Yet shipments did not nearly foot the mark of other months, for the simple reason that the executive and working forces were not in harmony with the other conditions.

It is obvious that this condition of affairs is only temporary. There is no sign whatever of an abatement in the steady influx of business. On the contrary it is predicted that September will turn out to be the banner month of the year in point of both orders and shipments.

The only complaints heard are those applying to the shortage of raw materials and the prolonged strike in the anthracite coal regions, conditions which keep consumers guessing all the time. A little better feeling exists among foundrymen. The home supply of pig iron has been considerably augmented by the various cargoes which have arrived from abroad. Many of the foundrymen in this vicinity have made liberal purchases of the foreign supply, and the effect of the augmentation is already noticeable. There is a better delivery of castings and the foundrymen are seeking to make contracts for future deliveries at today's prices. They do not, however, appear to be very successful in this direction, as machinery builders are skeptical of the continuance of present prices of raw material beyond the present quarter, or at any rate beyond the close of the year.

The advanced prices of machine tools made under the recently reported agreement of manufacturers have not asserted themselves to any great extent. It is evident that the spirit of the agreement has not been lived up to by all the manufacturers and dealers have made such rebates as were in their power in order to close prospective business. Competition amongst the dealers in the market is very sharp, and some time must elapse before the new prices are fully effective.

Foreign business appears to have been side tracked to a very large extent. Hardly anybody is making an effort to secure it, and from the inquiries coming in it does not seem as though foreign markets are open to take much in the way of machinery products. Those who have established trade abroad are keeping their connections in a way, but without the vim noticeable a short time ago.

One feature of last month's business was the broadness of the demand. Very few large transactions are reported, the volume being made up almost entirely of orders of little or no importance. This shows that the consumption is due mainly to re-equipment and extensions of plants. Plant for new enterprises is in very small demand. The different railroads are steady buyers of staples and the volume of business from railroad circles was never larger.

Dealers in machinists' supplies all report an excellent demand, and much trouble is being experienced in keeping up stocks of standard requirements. Another noticeable feature in the market just now is the steadiness of collections. A prominent dealer stated a few days ago that it has been some years since obligations were discharged as promptly as now.

The Keystone Elevator Inspection & Repair Co. is a new concern just started in business at 11th and Wood Sts. They are proposing to inspect regularly and keep in repair all kinds of elevators, and will make a specialty of repairs for electric elevators. They will keep on hand for immediate use an assortment of parts for all known makes of elevators, so that there will be no delay in procuring the necessary parts due to recourse to the maker's factory. The concern has just completed arrangements with the Commercial Electric Co., Indianapolis, Ind., for an Eastern agency for its electrical apparatus. J. W. Creager is president of the company, J. Jefferis is secretary and treasurer, and John G. Sproul is vice president and general manager. Mr. Sproul was for 16 years connected with Stokes & Parrish and the Morse-Williams elevator companies. About 16,000 elevators are at present operating in Philadelphia. The capital is $50,000 with $10,000 paid in.

There has been a combination of the interests of A. Falkenau and the Philadelphia Machine Tool Co. under the new name of the Falkenau-Sinclair Machine Co. The plant and equipment of the Philadelphia Machine Tool Co. has been removed to the Falkenau establishment, 109-15 North 22d St., where there is ample accommodation for both plants. The entire working forces and office staffs of both concerns are retained, and the businesses are being continued without interruption. They are not just now in the market for any new equipment, as with the combining of the plants there was little or no duplication of tools. Under the combination the plant will be devoted to the manufacture of high grade machine tools, special machinery, testing machines, presses and sheet metal working tools, hydraulic machinery, gas engines for motor wagons, etc. The Philadelphia Machine Tool Co. included among its shipments last month orders for six large presses to Pennsylvania and New York parties; a special cold saw to the Baldwin Locomotive Works; a large straight sided press weighing 12,000 pounds to the South, and an outfit of file cutters and grinders to a Philadelphia concern. Among the orders booked were several for testing machines, and others covering a large milling machine, and a shaper with traveling head. Mr. Falkenau among his shipments sent out a large punch with spacing table, and among his orders booked was one for ten special gasoline engines for auto-wagons.

The Pedrick & Ayer Co. continued very busy, but is not filling up on work any more than it can help, on account of the expected removal to its new plant at Plainfield, N. J., during the coming fall. The large pneumatic riveter, said to be the largest ever built, in a previous report noted as being under way in the works of this concern, has been completed, and is now being set up in the shops of the Central Railroad of New Jersey. Inquiries are reported as quite plentiful in all departments.

The Nazel Machine Works have changed their name and will in future be known as the Nazel Machine Tool Works. They are about bringing out a line of machine tools, principal among which will be new designs of centering machines and keyseaters.

The Franklin Machine Works, Inc., builders of boring, drilling and milling machines and cold saw cutting off machines, state that July was a busy month with them. Among their shipments they mention two large cold saws and two milling machines of large capacity to parties in the West.

Israel H. Johnson, Jr., & Co., builders of lathes, are fully as busy as at any time hitherto. Their shipments last month were both numerous and heavy, although confined in the main to tools of small to medium capacity. Among the larger tools shipped was a 50-inch lathe to parties in the West; a 42-inch, and two 30-inch lathes to local shops; and a 42-inch lathe with 29½-foot bed to the Camden Iron Works, Camden, N. J.

The month of July was fully up to the standard of previous months at the works of the Tabor Mfg. Co., builder of molding machines. A feature of the month's business was the demand for machines of large capacities. Among the orders booked was one for two machines for the Pennsylvania Railroad shops, and another from the Chicago, Burlington & Quincy R. R. for a machine—all three for use in the molding of journal bearings and similar castings. The company also secured an order for a number of large machines for the Niles-Bement-Pond Co. It will shortly put on the market a ma-

chine for making cores of various shapes which will prove interesting to many founders. One machine is now under way for use principally in making cores for steam and water fittings. The different shops of the company present a very active appearance, and are furnishing employment for 138 men. A machine now almost ready for shipment, which is attracting a good deal of attention from visitors, is the machine built for molding tunnel plates referred to in a previous report, and designed to work 9 feet in the clear. It is by far the largest molding machine ever built, but with the advancement made by the Tabor company in the development of the molding machine this big fellow is not destined long to hold the palm.

The Espen Lucas Machine Works, builder of cold sawing machines, grinders, and boring machines, which commenced to fit up its shop at Broad and Noble Sts. about 10 weeks ago, is now about to make shipment of its first batch of machines. These are all cold saws of a new type, patents on which are now pending, the design being by Mr. Lucas (formerly with the Franklin Machine Works). The new cold saw is quite a departure from existing types and is designed to sell at about three-fifths of the price of the lowest machine on the market. It is simple in its design and universal in its work. It is said to have been subjected to the hardest tests, and comes fully up to the standard demanded in such a tool. It has an automatic feed, easily regulated for fast or slow speed to suit all classes of work. It is being made in three sizes and styles to suit steel and iron foundries, and for sawing beams. The company is booking quite a lot of orders for the new machines, and it is probable that for a time the shop will be run exclusively on them.

The J. W. Creager machinery agency at the Bourse secured a satisfactory amount of business last month. Orders as a rule, however, were for single machines.

Walter H. Foster, of the Bourse, reports some good sales of Potter & Johnston, Gisholt, and Landis tools. A good inquiry is being met for the new ring turrent lathe just marketed, and some little trouble is being experienced in keeping up with the demand.

The Akron Electrical Mfg. Co., Akron, O., expects, in the near future, to build a large addition or possibly build an entirely new plant. Plans have not yet been fully decided upon.

The report widely published in the past week that Pickands, Mather & Co. intend to build a steel plant in conjunction with their new blast furnace at Toledo, is entirely without foundation.

A new foundry is to be built and other improvements made at the plant of the Detroit Shipbuilding Co., the aggregate cost being $50,000. Electric cranes will be installed in the new foundry.

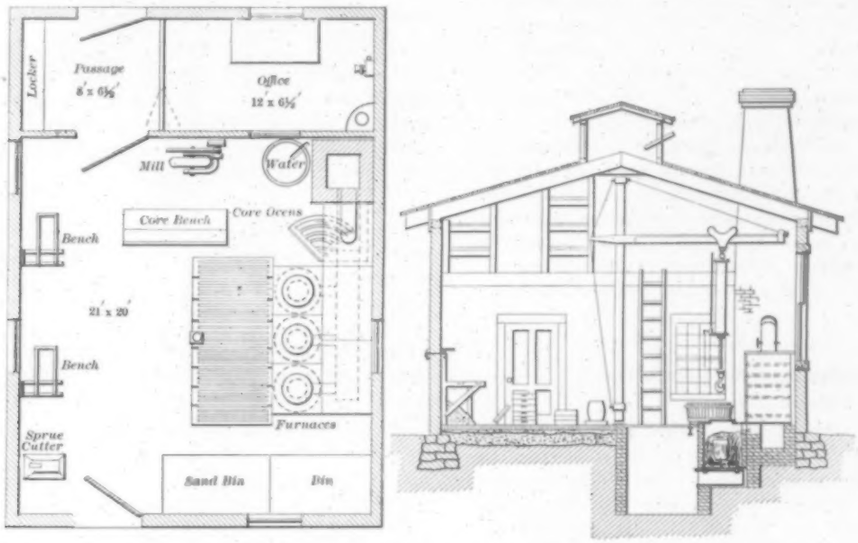
EQUIPMENT FOR A SMALL BRASS FOUNDRY.

While brass founding can be carried on in the same building as is devoted to iron founding, it is generally more satisfactory to keep these departments separate. Wm. F. Torrey, of Quincy, Ill., who says he recently had occasion to lay out a small shop, illustrates in *Machinery* the general plan of same. As will be seen, the building is divided into two sections, the small one being used for an office and the larger for the foundry. In this foundry on the right are three furnaces, with a core oven built over the flue, arranged with a sliding damper which takes part of the waste heat through it to dry the cores. On the left are the benches. Tubs are not much used; they are considered unhandy, as with them the sand cannot be as easily handled. The sand is tempered on the floor and then thrown back against the wall for further use.

One of the features introduced was a crane, with air hoist, so arranged that it could be turned around and cover nearly the entire floor, lifting the pots of melted metal from the furnace and removing the ashes from the pit.

Over the office is a loft with shelves on one side and a space for an electrically-driven air compressor with receiver to supply air for hoisting, dusting, rapping and chipping. The electric motor when not driving the air compressor is used to run the mill for grinding the cinders.

The sketch is of a small-sized foundry, but where more room and benches are needed the foundry can be enlarged in proportion.



PLAN AND ELEVATION OF BRASS FOUNDRY.

The Republic Iron & Steel Co., has purchased a tract of land for $20,000 adjoining the site of the Laura furnace, Youngstown, and it is understood that a blast furnace will be built. The company is not ready, however, to announce its plans.

Harry Orwig, formerly of the Niles Boiler Co., Niles, O., is reported to have about completed arrangements to erect a large boiler works.

It is reported that an important discovery of iron ore has been made 13 miles north of Two Harbors and 50 miles south of the recognized southern limits of the Mesabi and Vermilion ranges. Thorough explorations will be made.

A Pittsburg steel company recently obtained an option for a large tract of land along the lake shore, near Cleveland, for a new plant, but the option was allowed to expire Aug. 1 and the money put up was forfeited.

The Colonial Steel Co., Pittsburg, whose plant is located at Colonia, Pa., has commenced the erection of four additional heating furnaces, two of which are to be completed by Aug. 15 and the remaining two by Sept. 1. All the departments of the company's plant are now in full operation.

JACKSON IRON & TIN PLATE COMPANY.

The Jackson Iron & Tin Plate Co., of Clarksburg, W. Va., was organized July 21, 1901, and on Aug. 1 ground was broken. The plant was built especially for the manufacture of tin plates and iron sheets and consists of the following mills:

Eight hot mills, five cold mills set in tandem, three double annealing furnaces of 100 tons capacity, 16 heating furnaces, two Mesta picklers of 150 tons capacity complete with vats and other apparatus, 12 tinning stacks together with the other necessary machines for the production of tinned sheets ready for the market. In addition to this, the company has provided a bar mill of 75 tons capacity, for producing the tin bars necessary for the use of the plant.

Power to the hot mills is furnished by double compound Watt-Campbell Corliss twin engines of 1,250 h. p. to each engine. The cold mills are operated with a 350-h. p. Hamilton Corliss engine. The various shears and the machine shop are furnished power by a 250-h. p. engine, while another engine of 100 h. p. furnishes power to the tinning department. A battery of five horizontal tubular boilers of a minimum capacity of 2,800 h. p. furnishes steam for the entire plant. The company has supplied its own electric plant of a sufficient capacity to furnish light to the plant and also to furnish power to operate the 30-ton Pawling & Harnishfeger crane. There is a complete machine and blacksmith shop fully equipped to turn out any repair needed in a few hours. Store room and warehouse capacity is ample and was built with a view to meeting future as well as present needs. The mill buildings are steel and wood structures and cover a total area of nearly 200,000 square feet. The company has now in contemplation the construction of an additional plant of eight mills for the manufacture of black sheets for stamping purposes. There is ample ground for this additional plant and the entire product will be taken by an associated concern now locating in Clarksburg to manufacture stamped and galvanized ware in large quantities. Work on this new plant will probably begin not later than Sept. 1.

To Centralize Ingot Mold Production.

(Special Telegram.)

PITTSBURG, Aug. 6.—The American Ingot Mold Co., of this city, is contemplating the centralization of its five plants at an early date. Four ingot mold plants are operated by the company as follows: Thomas D. West Foundry Co., Sharpsville, Pa.; James E. Thomas Co., Newark, O.; Marshall Foundry & Construction Co., and Wm. Yeagle & Co., Pittsburg. The plant of the Mesta Machine Co. was also taken into the combination but it is not operated at the present time. All of the foundries mentioned conduct other lines of the foundry trade in addition to manufacturing ingot molds and when the plants are centralized these various concerns will probably expand their other lines to make up for the ingot mold end. The ingot mold foundry will be very large, with a daily output of about 400 tons. Plans are already under consideration.

The foundry of Binkley Bros., Neustadt, Ont., was damaged by fire July 31. Loss $8,000; insurance $1,600.

It is announced that within a few days the Detroit & Cleveland Navigation Co. will sign contracts with the Detroit Shipbuilding Co. for two side wheel steamers, to be larger by 20 percent than anything now in the passenger business on the great lakes. The two boats will cost over $800,000 each and will have sleeping accommodations for between 1,100 and 1,200 people.

The foundry of the Clark Engine & Boiler Co., Kalamazoo, Mich., was damaged by fire to the extent of $25,000 on Aug. 2.

In their New York letter of Aug. 2, Rogers, Brown & Co. say: "It is probable that the tonnage of foundry iron placed in the past ten days for delivery January to June, 1903, will aggregate 300,000 tons. This on top of 300,000 to 400,000 tons previously placed makes the total of foundry iron already booked somewhere between 600,000 and 800,000 tons. Assuming the output of this class of pig iron to be 4,000,000 tons a year, it would appear that about one-third of the first half is already under contract. Several of the largest consumers announce themselves as completely booked to May 1."

J. Callaghan & Son, sheet metal and roofing contractors, Cleveland, have completed their new factory and store building at 623 Superior St., and have moved from their old building on Erie St.

The tin workers affiliated with the Amalgamated Association of Iron, Steel and Tin Workers have rejected the proposition of the American Tin Plate Co. providing for a reduction of 25 percent on all rebate tin plate rolled in this country. The proposition was defeated by an overwhelming majority, the large mills at New Castle, Pa., throwing their weight against it and registering large negative votes. A meeting will shortly be held at New York between the officials of the American Tin Plate Co. and those of the Amalgamated Association for the purpose of deciding upon the footnotes of the tin plate scale which have not yet been arranged. At this conference it is altogether probable that the vote of the tin workers will be reported and future action if any will be discussed. The Shenango plant of the American Tin Plate Co., New Castle, Pa., was shut down this week for repairs. The plant of the company at Gas City, Ind., has also been closed for a brief period.

The Newton Machine Tool Works, 24th and Vine Sts., Philadelphia, will shortly go to press with a new catalogue consisting of about 250 pages. The catalogue will be of the standard size, 6x9 inches. The company will send a copy to any address furnished.

The Blaine Coal Co., of Pittsburg, has been incorporated with a capital of $100,000 for the purpose of developing a tract of 1,200 acres of coal land located near Elizabeth, Pa., on the Monongahela River. The incorporators are Henry W. Oliver, Henry A. Kuhn, D. J. Crump, John J. Jenkins and H. O. Evans. The daily output will be about 4,000 tons and will be shipped mainly to the mills controlled by the Oliver interests.

The Cambria Steel Co., Johnstown, Pa., is receiving orders on plates down to 5-16 in thickness for delivery in October. The new 134-inch plate mill will probably be placed in operation in September, and through the remainder of the year nothing under 5-16 inch plates will be turned out. Orders are also being received, delivery next year, for ¼-inch plates and lighter. The slab mill is also progressing favorably, but it is doubtful if it will be placed in operation before November. A finishing mill will be operated in connection with the slab mill for tin and sheet bars.

During the month of July, the Pittsburg, Bessemer & Lake Erie Railroad carried 500,000 gross tons of ore from Conneaut, O., to Pittsburg. The shipments during the month of June, however, broke all previous records amounting to 555,370 tons. The best previous record was 491,000 gross tons, made in August of last year.

The citizens of McKeesport, Pa., are planning for a great jollification on Sept. 1, to celebrate the location of the new $10,000,000 tube plant of the National Tube Co. in their city. President Charles M. Schwab, of the United States Steel Corporation, will be invited to attend and deliver an address.

A charter was granted the Garland Nut & Rivet Co., of Pittsburg, this week. The company has a capital of $200,000, and will locate a plant at West Pittsburg. Details were given in a previous issue.

The Board of Trade of Salem, O., has guaranteed the Leetonia Tool Co., of Leetonia, O., the bonus asked by it to remove its plant to Salem, and it is expected the move will soon be made.

The new plant of the New England Steel & Casting Co., Trenton, N. J., will be placed in operation early in September.

A NEW MICROMETER CALIPER.

A novel micrometer caliper has recently been added to the line of measuring instruments manufactured by J. T. Slocomb & Co., of Providence, R. I. The new tool is especially designed for measuring soft sheet rubber but is well adapted for use on other materials, such as sheet metal or wire. It differs from other micrometers in at least four important particulars. The thimble makes but one rotation in measuring the full amount of its range (¼-inch) and there is but one scale of graduations, all on the dial in plain sight. The lead of the measuring screw is so great that there is but little liability of error on account of the slightly different degrees of pressure which may be brought to bear on soft material. The micrometer is held and entirely operated by one hand, leaving the other free to hold the work. Neither of the measuring points rotates, which is a considerable advantage in measuring soft or sticky material.

The general appearance of the tool is seen in the halftone Fig. 1 and the constructional details are shown in the engraving Fig. 2. The thimble D has an internal thread ¼-inch

FIG. 1.—A NEW MICROMETER CALIPER.

long. The enlarged end of the sleeve E has an external thread to fit the thimble D but ½-inch long, allowing the range of travel to come on the external thread which can be made more nearly accurate. The thimble D has a plain bore at F which fits loosely on the enlarged part of the sleeve E and excludes all dirt from the screw threads. The screw threads are multiple, 32 P. but ¼-inch lead.

The plunger rod G has two bearings in the sleeve E; one bearing is in the enlarged bore at the thimble end of the micrometer and the other is in the bushing near the measuring cap. The plunger rod slides freely through these bearings and is prevented from turning by a small key working in a keyway in the sleeve E.

The pointer at H is clamped to end of plunger and does not rotate, the dial being rigidly attached to the thimble; thimble and dial rotating under the pointer. A spring J surrounds the plunger rod and fits loosely in the sleeve. This spring is under compression and torsion, the one taking up the blacklash in the screw threads also on the thrust of plunger inside of the thimble, and by means of the torsion the key is maintained with a constant bearing against the side of its keyway, effectually preventing the pointer from shifting its position on account of any looseness in fitting.

The gauge is held with the handle K resting in the palm of the hand, with thumb and fore finger on the thimble and the other fingers on the sleeve E. The thimble is quickly and easily operated in this position by the thumb and forefinger. The adjustment for wear beyond that which is taken up by the spring action is made by shifting the pointer which is held in place by a split hub and screw. The firm proposes to manufacture these gauges with small points for measuring metal, also with different dials; some will be graduated to measure in thousandths of an inch and others will correspond with the various wire gauges.

TRADE PUBLICATIONS.

No. 4 of Ryerson's New Technical Library has advanced to a third edition. It is a neatly bound, 4½x7-inch, well printed treatise on "Continental" boilers with Morison corrugated furnaces. The book contains 96 pages, and nearly all of these have one or more illustrations. A great amount of information is submitted in answer to the queries propounded on the title page in regard to the purpose, location, capacity and reputation of these boilers and furnaces. The little book is interesting enough to be retained for reference on some general boiler topics and is at the same time specific in its advertising of the firm of Joseph T. Ryerson & Son, Chicago.

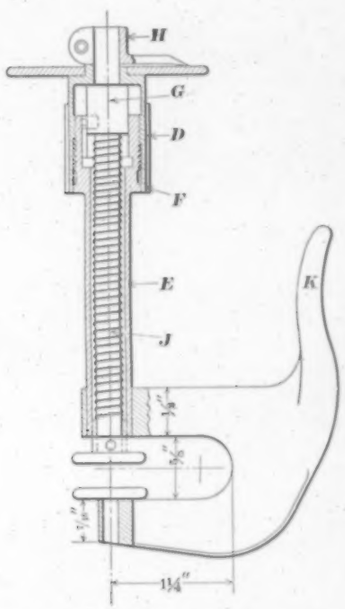


FIG. 2.—DETAILS OF MICROMETER CALIPER.

The "Wood" direct current enclosed arc lamps for power circuits are exploited with some creditable half-tones and other descriptive matter in a neat folder received from the Fort Wayne Electric Works, Fort Wayne, Ind. A larger circular has also been prepared and is known as Bulletin No. 1026 treating on a like subject in greater detail. This latter circular is at hand with Bulletin 1033, which treats of integrating switchboard wattmeters and the monthly calendar sent out regularly by the firm.

"The New York Rapid Transit Tunnel" is the title of a timely and highly interesting publication issued by the Rand Drill Co., of New York. Some 56 11x9-inch pages are devoted to the tale which starts out with an outline of the growth in population and present requirements of the island of Manhattan, then proceeds with an account of the earlier history of rapid transit, culminating in the development of the plans for the general subway construction now in progress. The story of the excavation, with a recital of the materials to be removed or introduced, will be followed with zest as it is intelligently illuminated with many full-page illustrations, profiles and maps of the course of the work. Some things are unob-

trusively said of the Rand drill and equipment and the part they are playing in the undermining of New York.

The Fosdick Machine Tool Co., of Cincinnati, has a new catalogue devoted to the line of radial drills. The publication is standard size, 6x9 inches, and is a production of some 80 pages with many illustrations; one of the half-tones shows 25 3-foot radial drills in course of construction.

The Crescent Machine Co., of Leetonia, O., has a second edition of the catalogue treating of the Crescent wood working machinery. This includes band saws, combination saw tables, jointers, setting clamps and saw blades. The machines and special as well as regular attachments are described at length and one of the pages gives a workmanlike description of a good method of brazing band saw blades.

The demand for the catalogue of the Buffalo improved ventilator manufactured by the Buffalo Forge Co., of Buffalo, N. Y., has exhausted the supply and a new one has just appeared in a neat two color typographical dress. The forges and engines of the company are illustrated and briefly described.

The claims of the Davis Boiler Feed Co., of Birmingham, Ala., are set forth in a 5x7-inch pamphlet describing the construction and application of the system. The principle and details of the device are shown by a number of line drawings and half-tones.

O. P. Letchworth, president of the Pratt & Letchworth Co., Buffalo, was elected president of the United States Hame Co. at a meeting at Buffalo, last week, attended by hame manufacturers from different parts of the country. As a result of the meeting the capital stock of the United States Hame Co., of Buffalo, was increased from $10,000 to $1,600,000, of which $600,000 is preferred stock and $1,000,000 common stock. Buffalo will have the principal office of the company. The other officers are: Walter S. Carr, Andover, N. H., vice president; Frederick Frazer, Syracuse, N. Y., secretary; George H. Bartlett, Sunapee, N. H., treasurer. There are two plants in New England, one in Buffalo, one in Cincinnati, one in Indiana and one or two others are being established at advantageous points.

The Allis-Chalmers Co., of Chicago, recently declared its fifth consecutive quarterly dividend of 1¾ percent and it was paid Aug. 1 out of net earnings.

The Charles Parker Co., of Meriden, Conn., will shortly increase its gray iron capacity materially. The brass foundry recently damaged by fire will also be repaired.

The Lake Shore Novelty Co., Findlay, O., has purchased an acre of land from the Findlay Toothpick Co. and will erect a number of new buildings.

The Lloyd Gas Construction Co., Detroit, has started to manufacture gas machines and engines at its new plant.

A System of Foundry Cost-keeping

BY S. F.

I will attempt to place before the foundry man a system of keeping an accurate account of the cost of castings of all kinds.

First. The cost of pig iron and scrap is a known quantity, and the weight of the castings gives the cost of such raw material, with the required percentage as an allowance for shrinkage in passing through the cupola.

Order No. 885. Pattern Received June 10th '02. Dept. 3. Ship Rough

Customer Eastern Engine Co.

Cast.	Charged	Quantity	Items	Weight	Total Cost	Cost per lb.
1	1	2	60" Cyl. Tops	90 00	$180 00	2¢ 00
14¾	18½		Mld 5½ H3½ C3¢ S2¢			
1		2	60" Cyl. Pistons	73 00	$146 56	2¢ 00
15½			Mld 4½ H2.5¢ C2.5¢ S2¢			

THE IRON TRADE REVIEW

FIG. 1.—COST CARD. ORIGINAL, 6 X 4 INCHES.

Second. The card system shows how the labor cost is ascertained for all castings from ½ pound upwards, by taking an accurate account of the time spent per day on each piece, and figured for total cost when charging the castings for delivery from foundry.

Third. The proportionate cost of supplies and material other than iron, scrap, coal and coke. This item includes rent, taxes, light, sand, facings and all other incidentals, too numerous and too small to locate on each casting but requiring a certain percentage.

Fourth. The cost of non-producers, namely manager, superintendent, foremen, clerks and all miscellaneous help around a foundry, other than molders' helpers, that being charged direct to the casting (see card), which is a large item of expense in every foundry, and which must be accounted for in order to have an accurate cost on each casting.

Let us now turn to some details of the system referring to the illustrations from the actual cards. First, take the iron: Foundrymen who have kept costs generally agree to allow 1 cent per pound for melted iron and fuel consumed, not including the help around the cupola. That being a fixed charge, take 25 percent of the actual weight of the casting and that will represent the cost for non-producers. To this

REJECTED CASTINGS.

June 19th 1902

Casting	Rejected by	Cause	Foreman	Moulder	Apprentice	Weight	Moulder's Time	Helper's Time	Total Cost
60" Cyl. Top	Page	Blown	Page	Jenks		9000	4h 45h	3d.	$180.00
24" Hand Wheel	"	Casting			Dick	78	2h		$1.85

THE IRON TRADE REVIEW

FORM FOR REJECTED CASTINGS. ORIGINAL, 13½ X 6 INCHES.

sum must be added the actual number of hours molding at rate per hour paid, or if rates vary the average rate per hour for each molder, a clerk being sent around to each molder for an account of his time and that of his helper; the actual number of hours work on the job by molders' helpers, coremakers, cleaners and chippers, and the rate per hour for each workman. Standard cores are charged at an average rate but special or large cores are checked by the actual time recorded in the core room. To these items must be added 25 percent of the sum; this 25 percent representing supplies, as facings, sand, and every other thing necessary in a foundry to produce castings, as well as rent, light, insurance, taxes, etc. The total amount is the actual cost to the foundryman for each casting made. Appended is an illustration from an original cost card for a 60-inch cylinder top:

Cupola No. June 10th 1902

Mixtures	Coal	Coke	Fdy. Scrap	Yard Scrap	Wheels	Steel	Pig	Pig	Pig	Pig	Pig	Pig	Total
Soft Iron	500	350	3000				Ashland		S. Superior				6500
	100	300		3500			500		3000				6500
							500		2500				
Total	600	650	3000	3500			1000		5500				13000

Time of Lighting,	1.15 PM	Remarks:
Blast put on,	4.45 PM	
First tap,	4.52 PM	
Bottom dropped,	5.33 PM	
Length of heat,	48 Min	
Condition of iron,	Very Hot	
Ratio of iron to fuel,	1 to 10	W. J. C. Foreman.

THE IRON TRADE REVIEW

FIG. 3.—CONSUMPTION OF IRON AND FUEL. ORIGINAL, 11 X 8½ INCHES.

Another colored card, as yellow, is used for bad or rejected castings. This card also has a duplicate for foundry reference. When the extra casting is made the complete charge is made against the bad list and the card going through is not required to be handled the second time.

Weight of casting, 9,000 pounds at 1 cent	$ 90 00
25 percent of above for non-producers	22 50
Molder at 30 cents per hour, 4.5 days	13 50
Molders' helper at 15 cents per hour, 3 days	4 50
Coremakers at 25 cents per hour, 3 days	7 50
Cleaners at 20 cents per hour, 2 days	4 00
Total for labor and iron	$142 00
25 percent of total for supplies	35 50
Total cost	$177 50

The cost of the casting, $177.50, divided by the weight, 9,000 pounds, gives the cost per pound at 1.97c. The total cost, etc., is shown on the card illustrated in Fig. 1.

The form for rejected castings is given in Fig. 2 and is a convenient method of reference to causes of bad work, etc. The cost of the casting is figured up the same as good work in order to show how much has been lost to the foundryman.

Fig. 3 gives the consumption of iron and fuel everything being noted that goes into the cupola. The space for remarks is reserved for mention of any unusual occurrence at the time of the heat, etc.

The sheet of foundry supplies is illustrated in Fig. 4. This form gives an account of such materials as sand, sea coal, coke facing, coal and coke for ovens if any are used, fire bricks for cupola and fire clay for general use. The tool room keeper checks plumbago, flour, molasses, core compounds, mineral blacking, wire nails and all other supplies.

The cost card system is handled on cards of three different colors. A white card is used for the original order with a duplicate on a white card prepared by carbon, the duplicate being retained in the foundry for future reference, and the original card traveling to the cost clerk who files them away when the order is completed. A colored card is employed for cases of partial delivery on an original order, as for example, for 12 castings, 5 being made and ready for delivery; here the original card must be retained on file until the order is completed. Then this partial delivery card checks the 5 castings delivered with the same system of duplicate cards for foundry reference.

Each of these cards is similar to the others with the exception of the color, and the arrangement is shown in Fig. 1, covering an original order.

The cost of the different items entering and leaving the foundry is given on the card seen in Fig. 5. This is a complete monthly report for the labor cost as well as the foundry and pattern shop. Fig. 6 is the weekly report prepared after receiving the statement of wages each week from the cashier. The monthly reports give a record of the percentage of same to the weight of castings produced but the cost of sand is included in cost of supplies.

The semi-annual report is illustrated in Fig. 7 which shows how one foundry in the United States is run on so complete a system that it answers all demands and gives every one connected with the institution the information that is required and that should be given to those in charge to know how they are progressing, so that any trouble can be located without special effort.

The Cambria Steel Co. and the Pennsylvania Steel Co., both controlled by Pennsylvania Railroad interests, are increasing factors in the production of steel in the United States. The Cambria Steel Co.'s output of finished material this year is expected to reach 750,000 tons, or from 20 to 25 percent increase over last year. The Pennsylvania Steel Co. last year produced about 650,000 tons of material, and will do as much or more this year.

THE CINCINNATI MACHINISTS' STRIKE OF 1901.

The machinists' strike of 1901 was called in Cincinnati on the morning of May 20. The machinists of Cincinnati, during the spring of 1901, had the demands presented by them to the manufacturers passed on by a board of conference. That board reported the case for final arbitration to the National Metal Trades Association, but the machinists called their strike before adjustment, as in most other localities. The manufacturers of Cincinnati had expected an arbitration board subsidiary to the National board to sit in Cincinnati to settle the questions in dispute, but in common with the manufacturers all over the country, they were disappointed in this hope.

A year previously, the Metal Workers' Club, of Cincinnati, had been organized and was officered by members of the National Metal Trades Association. It had had a year of success after the New York agreement was signed; the manufacturers of Cincinnati had settled themselves down for a period of peace, but their organization was not allowed to lapse. While it was thought that the Metal Workers' Club would not have to take any action relative to labor questions, that these matters would all be settled for them by the National agreement, the good fellowship and acquaintanceship brought about by these meetings during times of trouble were recognized as desirable. The club held frequent meetings and occasional dinners. The meetings were profitable, as various questions affecting shop management were brought up and thoroughly discussed. It was the interchange of ideas and the profiting by each other's experience that brought about the club's continuance, and the club was in good shape when the strike came on. One of the first actions taken during the strike was to change its name from the Metal Workers' Club to the Cincinnati Metal Trades Association.

The strike was severe. For many weeks meetings were held two or three times a week, but none of the members had anything of importance to report. The pickets continued active, and the men continued firm, in spite of the fact that the promise of strike benefits made them by the union before the strike and during its early days were not fulfilled. About the sixth or seventh week of this trouble, some slight breaks were made in the ranks of the strikers, a few men began to drift in here and there. Picketing became more and more severe, and finally culminated in inevitable violence. Injunction suits were brought, and when it was seen that the strike was lost, as a general fight, the men decided to go to work in all shops, excepting those of the Laidlaw-Dunn-Gordon Co. The above company's shops are located some twelve miles from the city in a suburban village. The mayor of this village was a machinist. The authorities had no control, seemingly, over the pickets, and it was supposed that the running fight could be continued on that company by having the men at work in all the other shops contributing to the Laidlaw strikers. This course seemed to be decided on at the end of the eighth week of the strike. The following Monday developments showed that this action was to be taken, and a hurry call was sent to the members of the Cincinnati Metal Trades Association to attend a meeting on Tuesday. Out of forty-four members, forty-one attended, the other three being absent from the city. Plans for meeting the new phase of the fight were discussed from every point, and it was finally decided to leave the whole matter to the executive committee with full power to act. The executive committee was well supplied with funds, as an assessment of $3 per operative was levied and collected in the early stages of the trouble. The executive committee of the association met on Tuesday evening and decided on the full

FOUNDRY SUPPLIES USED. June 12th 1902

Coxsackie	Fire	Jersey	Albany	White	Sea Coal	Coke Facing	Egg Coal	Split Brick	Arch Brick	Clay	Miscellaneous
2000	2000	2000	2075	2000	800	280	2500	#150 Brick	#75 Brick	2080	Coke 975.
2000	2000	2000									
2000		1980									

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FIG. 4.—CONSUMPTION OF FOUNDRY SUPPLIES. ORIGINAL, 12 X 6 INCHES.

FOUNDRY FIGURES FOR:

Sand, No. of lbs., —% —		Number of rejected castings	
Metal melted		Rejected castings, wt.	
Fuel used		Per cent. rejected castings	
Percentage of fuel used		Cost per lb. cupola	
Metal brought from yard		Cost per lb. supplies	
Castings charged		Labor cost per lb. with P.S.	
Percentage of shrinkage		Labor cost per lb. without P.S.	
Number of castings charged		Total cost per lb.	
Average wt. per casting			
Remarks			

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FIG. 5.—MONTHLY EXPENSE CARD. ORIGINAL, 6 X 4 INCHES.

FOUNDRY FIGURES FOR:

	Week Ending		Month Ending	
Sand, No. of lbs., —% —				
Castings charged				
Rejected castings				
Per ct. rejected c'g's				
Moulding per cwt.				
Core-making "				
Scratching "				
Moulders' helpers "				
Furnace "				
Mcs. help "				
Total non-prod'c'n "				
Total "				
Pattern Shop "				
Total "				

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FIG. 6.—WEEKLY EXPENSE CARD. ORIGINAL, 6 X 4 INCHES.

line of policy to be pursued. The first action taken was to telegraph all papers in Indianapolis, Dayton, Hamilton, Springfield and Columbus the following advertisement, to be inserted two inches, double column, in conspicuous position:

"Wanted—Machinists, to take strikers' places at the shops of the Laidlaw-Dunn-Gordon Co. Bonus of $5 per week, continuing at least four weeks, will be paid. Steady employment for competent men. Full protection guaranteed. Apply to —— at —— Hotel.
(Signed.) "Cincinnati Metal Trades Association."

Different firms were levied upon for reliable employes to send to these various cities to receive applications and bring men through. These agents started for these cities the same night, and were ready for business bright and early Wednesday morning. Early Wednesday morning, before 7 o'clock in fact, messenger boys were started out with a letter of instructions to each member of the association. This letter ordered them to do several things.

First, to absolutely not put on another man, no matter how badly needed, until the committee gave the word.

Second, to give a list to the messenger of all men that they knew not employed, giving their names and addresses, class of work such men had been doing, and the rate of wages previous to the strike.

Third, to take applications from anybody who came along, and to send the applicants to the Metal Trades Association office, and see that they got there.

FOUNDRY FIGURES FOR: July - Dec'o

Sand, No. of lbs.—§—	2562285·41%	Number of rejected castings	544
Metal melted	9127500	Rejected castings	129130
Fuel used	1389220	Per cent. rejected castings	2.02
Percentage of fuel used	15.2 or 6.5%1	Cost per lb. cupola	.00762
Metal brought from yard	6909580	Cost per lb. supplies	.00079
Castings charged	6224187	Labor cost per lb. with P.S.	.00859
Percentage of shrinkage	2.9	Labor cost per lb. without P.S.	.00748
Number of castings charged	18542	Total cost per lb.	.01696
Average wt. per casting	335	With F'd'y Ex.	.02116
		With Pattern Shop Ex.	.02165

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FIG. 7.—SEMI-ANNUAL REPORT. ORIGINAL, 6 X 4 INCHES.

Fourth, to furnish to the executive committee at a time and place to be set later 2 percent of the number of men they had at work previous to the strike, for use as strike breakers in the Laidlaw plant.

The committee determined that the Laidlaw shops should open up on Friday morning, and spent Wednesday and Thursday making every preparation. The lists above referred to, were all at hand before 11 o'clock on Wednesday. A circular letter was sent to every man on these lists, stating in effect that the association offered him a position at the Laidlaw-Dunn-Gordon Co.'s shop at his previous rate of wages, and offered him in addition a bonus of $5 per week, the bonus to be paid at least four weeks, all provided that he would apply at the Metal Trades Association before Thursday at 3 p. m. Many of these letters were sent out by messenger boys; in fact, the messenger service of the city was crippled for two days by the demands of the Metal Trades Association and the special delivery service at the postoffice was overwhelmed. The men drifted into the office on Wednesday afternoon and Thursday. Their applications were taken and they were ordered to report at the C., H. & D. station at 6:30 a. m. Friday; and the manufacturers were directed to bring the men assessed by the committee to the same place at the same time. Most of these men so furnished by the manufacturers were foremen, gang bosses, etc.

As regards protection, arrangements were made with a detective agency to furnish 25 special police, and two members of the executive committee called on the mayor to have them sworn in as deputy marshals. His Honor was advised about as follows: That the company is going to start the Laidlaw shop at Elmwood Friday morning; that the pickets had been and were very active, and have annoyed and injured several men, and would probably attempt to annoy and injure the men who would start work, and the committee would like to know what protection he would give. He stated that he was always willing to protect the men, but he could not get any one in his village to serve as deputy marshal. The committee volunteered to furnish the deputy marshals, if he would swear them in, which he agreed to do, and he was told that they would have 25 men at Elmwood on Wednesday evening to be sworn. The number staggered him, and he threw up his hands, saying the village could not afford to pay so many men, but when told that the association would pay them, he saw that his last excuse was gone, and agreed to fulfill his promise. The men were on hand as promised and were duly sworn in.

On Friday morning the police, accompanied by at least a dozen manufacturers, were on hand at the station, got their men through the picket lines which were formed there, and put them in a special car at the end of the train. It made a large crowd, and filled the car to overflowing. The proceedings being well known in the village, the whole population were at the station to see what was going on. The train, however, did not pull up to the station, but stopped a few hundred feet short, in front of the works. The car-full of workmen, police and manufacturers went into the shops and the shop was started. The strike breakers continued to come in during the day from various points, and the number coming from the city itself and from the outside most certainly astonished the strikers for they had been predicting that the shop could not run.

By Friday noon they saw that the "jig was up" and held a meeting. The committee from this meeting approached Mr. Laidlaw asking him on what terms they could return to work. They were told that they could make application, and be placed as fast as he had room for them, that he would take only such men as he wanted, that the shop would run the same number of hours it had run when the strike was started, namely, 57 hours per week, and that all men taking employment should do so under the declaration of principles. They were also given to understand that any men going to work, who interfered in any way with the strike breakers, would be summarily discharged. The committee returned to the meeting, which acknowledged its defeat by allowing the men to go back to work. The next week a number of them had to be discharged for interfering with the strike breakers. The order not to employ men was rescinded to the other members of the association, and the concentrated Laidlaw strike was broken in one week.

The action of the Cincinnati Metal Trades Association is in itself the most magnificent tribute that can be paid to the loyalty of the manufacturers of that city. During the strike they stood to a man, shoulder to shoulder, without a break, or waver in the ranks. Their action was absolutely united on every point. They voted assessments by unanimous vote, and paid them without a quaver or complaint. They followed the orders of their elected leaders without question, and their magnificent discipline enabled them to break the severest strike that Cincinnati has ever known. No blacklist was laid against any man, and the greatest moderation was exercised with the strikers in every way. This could not help but be appreciated by the good and conservative men, of whom there are a great many working in the Cincinnati shops.

Although notices had been posted in all the shops that after May 20, in accordance with the New York Agreement, the shops would run a 54-hour weekly schedule, when the agreement was broken by the men, the manufacturers did not attempt to go back to the 60-hour week, after having run 57 hours for six months, but simply stopped where they were, and they are running 57 hours yet.

Without a thorough and loyal association, successful action of this sort would have been impossible and no man can convince the forty-four shops belonging to the Cincinnati Metal Trades Association that organization is not a good thing. They know by experience that it is, and has done more for them than the strongest could do alone and single-handed. Their organization was formed under pressure from the other side; the manufacturers did not want to organize, but they were compelled to. Their motto might well be as Shakspere puts it:

"Beware
Of entrance to a quarrel; but, being in,
Bear't that th' opposed may beware of thee."

—[Bulletin of National Metal Trades Association.

SUGGESTED AT THE SHOP.

BY F. O. REMAN.

The toolholder is one of the things that fill a long felt want if ever there was a want to be filled. They are intended to use bits of tool steel cut from the bar, bits that need grinding only to put them in shape for cutting. No forging, and in many cases no tempering, is to be done. The long wait while the machinist sat on a nail keg or a tool box is a thing of the past. No more talks with the blacksmith or his helper while the diamond point or the side tool is deftly formed, hardened and drawn, with the nice discrimination that stamps the wary craftsman. For that matter, the oldtime blacksmith is on the wane and is making his main stand as a horseshoer, a field in which machinery does not touch him directly as yet. But if horses are not yet shod by machinery, the automobile is supplanting them; slowly, it is true, but surely. That is, however, another story and I must get back to the toolholder.

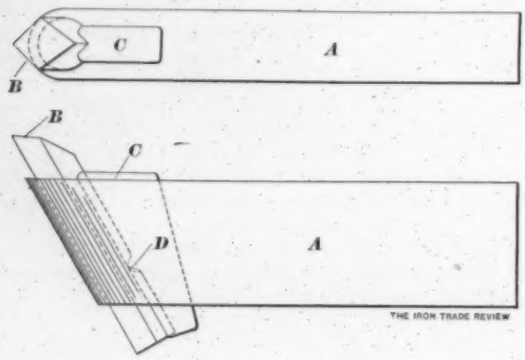


FIG. 1.—F. O. REMAN'S TOOLHOLDER.

* * * * *

The first toolholder I ever handled was made some time in the sixties. It was formed of two pieces of steel riveted together with a V-groove cut in each half near one end. The grooves faced each other and formed a square opening in which was inserted a piece of ¼-inch tool steel. A bolt drew the two halves of the holder together at that end and held the cutter firmly. The tool holder was hardened and within its range was a handy contrivance. It had a fault that is found in many other mechanical devices. The bolt was weak and the cutter having no other locking arrangement than the wedging of the two halves of the holder was a source of anxiety to the workman. A nice sense of touch was required to tighten the holder, just tight enough to secure the cutter in place, without straining the bolt to the point of fracture. Between the horns of the dilemma the work was delayed and bolts came to grief. Here was a chance for invention.

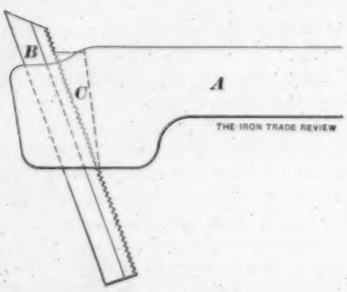


FIG. 3.—CUTTER HOLDER PATENTED BY JOHN F. ALLEN, 1882.

* * * * *

Assuming work of a wide range, light and heavy cuts, workmen light and heavy handed with a wide range of shop judgment, the monkey wrench adjustment and high pressure conditions generally; then what sort of a toolholder will best fill the bill? It is possible to avoid the breaking of bolts and screws by making them clumsily strong to discourage the monkey wrench trifler; but it seemed easier to discard threaded connections altogether. That would cut down the problem considerably and the monkey wrench would then be reserved as a substitute for a hammer. A screw is nothing more than a wedge. All I had to do was to arrange the wedge to hold the cutter firmly, fix the thing so that workmen may have confidence in the holding merits of the device, make it foolproof against monkey wrench diet and there's millions in it. The solution follows and incidentally I may say the millions are still in it.

* * * * *

Fig. 1 illustrates the device, the upper view being the plan and lower view a side elevation. A is the holder, or stock, and B the cutter. C is a wedge having a projection at D. The cutter may be round or square and a groove to meet D is cut in the side or edge by the corner of an emery wheel. The cutter and the part C are then combined as one wedge. As the cutter is ground away, another notch is cut for D and so on. The more pressure on the cutter, the firmer the combination holds; but the angle of the wedge will permit the parts to be loosened easily when required. No grumbling about the too convenient wrench; no breaking of screws; every part continuing in business at the old stand with no intermission between the acts. I could well imagine the welcome it would get from the toolmaker who has spent precious time in thankless drudgery annealing holders and digging out setscrews. But there's a hitch in the thing somewhere.

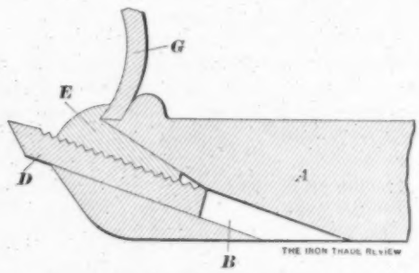


FIG. 2.—LATHE TOOL PATENTED BY HENRY O. WHITE, 1897.

* * * * *

The history of the art of making setscrewless toolholders may be worth reading. I have looked up a few chapters and find that my idea is not so "broadly novel" after all. Other people have noted the shortcomings of screws, the profaneless advantages of holders adjustable with hammers, etc. H. W. White in 1897 patented the scheme shown in Fig. 2. Here A is the stock, or holder, having a groove B which tapers at the outer end for the cutter D and the wedge E. The cutter and the wedge have teeth on the sides which come together so that the two parts may be firmly held in position in the slot. The inventor belongs to the modern school which abhors the indiscriminate use of the wrench. So it would appear at least from the drawings. He does not let the cutter or the wedge come through the holder so that a tap of the wrench could serve as the first step in readjustment. The end of a lever G is inserted between the shoulder of the wedge E and the holder. The latter has a rounded

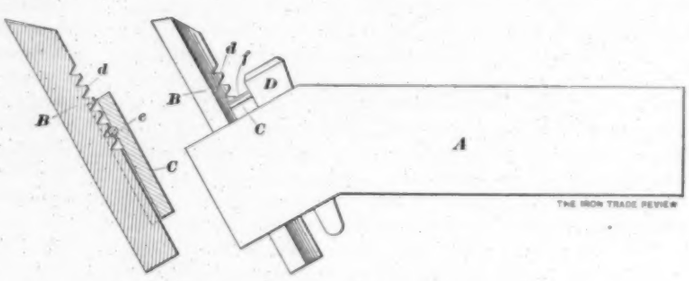


FIG. 4.—TOOLHOLDER PATENTED BY ISRAEL F. BROWN, 1867.

bearing to support and act as a fulcrum, while the lever is used to draw the key and cutter out of the slot B.

* * * * *

John F. Allen wrestled with the problem, and his solution was finally passed upon by the Patent Office in 1882. Here the holder A in Fig. 3 has a mortise for a cutting tool B and the wedge C, the two being held firmly by means of the teeth and the tapered hole through the holder. Going further back we find the toolholder invented by Israel F. Brown in 1867. Fig. 4 has an elevation of this toolholder at the right and on the left is a sectional view taken through the axis of the cutting tool and the gib. The holder is seen at A with a V-slot for the cutting tool B; the latter being notched at the back as indicated at *d*. C is a gib with a groove in one side to fit the corner of the cutting tool and the gib has a bit of wire *e* passing through it. The upper end of the gib has a flange *f*. D is a wedge. Mr. Brown points out that the key D may be grooved to operate both as a gib and a wedge, fulfilling the functions of the part C which is then merged in D.

* * * * *

The Brown patent is a refreshing change from the ever multiplying list of inventions. It was early in the game and no one had struck the rich vein of memory employment consisting in saying the same thing in the greatest number of ways. The claims of the modern patent are fearfully and wonderfully made and considering the pruning that goes on at the Office they must be well drawn out in the first place. Maybe it is a debatable point whether the fewest words would not result in the broadest claim. Everything depends on the words, of course. Brown did not have anything more than a description of the device followed by the following claim: "The notches *d*, in the tool, in connection with the wire *e*, or its equivalent, in the V-groove, in the gib or key, substantially as and for the purpose set forth."

* * * * *

It does not seem that these inventions leave much in the line of originality for Fig. 1. The holder there does not hump itself like unto Figs. 2 and 3, nor has it the teeth and lever attachments of these inventions. There is a suggestion of the notches and the wire shown in Fig. 4 and it does seem strange that Brown, who had a faculty for boiling things down, did not simplify his design. But the deadly "equivalent" is there at D sure enough in Fig. 1. Perhaps there may be an equally fatal something else about these toolholders, for it is hard to understand how the setscrewless grip failed to hold the fancy of machinists. Maybe the long felt want is not hungering for tools of this kind and the "toolholder and cutting tool firmly held together by a wedge" is not in it for a minute with the screwretained tool. On no other ground can I explain why these holders like so many other things failed to get beyond the promising stage.

The foundry to be erected by the Matthews Steel Casting Co., at Marion, Ind., will be 255 feet long, 62 feet wide and 30 feet high. It will be commanded by several electrical traveling cranes and the remainder of the equipment will be modern throughout. An acid open-hearth furnace with a capacity of 15 tons will be installed. The company has received a plot of ground 1,200 feet long and 135 feet wide and a bonus of $5,000 was paid to secure the location of the plant. The company is capitalized at $100,000.

The Western Foundry Co., of Chicago, which recently increased its capital from $50,000 to $100,000, has just completed an additional foundry, 110x210 feet. The company is also having plans made for another cleaning room, which will be 50x140 feet. These improvements will increase the capacity 50 percent. All of the necessary machinery has been purchased. The new cupola is a 72-inch Whiting with a No. 6 Root blower. An additional boiler and engine have also been put in.

George T. Pendrith & Co., Toronto, dealers in machinery, have assigned with liabilities of nearly $25,000. The amount of assets is unknown.

COLD SAW CUTTING-OFF MACHINE.

The new cold saw cutting-off machine manufactured by the La May Machine Works, Rochester, N. Y., is the result of much experiment and is built on substantial modern lines, the metal being judiciously distributed. Among the novel features is the grinding attachment which grinds the saw on its own arbor—an improvement which greatly increases the capacity and convenience of the machine at an inconsiderable advance in the price. The attachment is always available and the saw

FIG. 1.—FRONT VIEW OF LA MAY COLD SAW CUTTING-OFF MACHINE.

may be maintained with an even cut on the teeth and the latter always in proper shape. Fig. 1 shows a front view of the machine without the grinder and Fig. 2 is a rear view illsutrating the machine with grinder attachment. A swivel vise is another handy attachment for use in sawing angles and there is a safety friction feed which adapts itself to different grades of stock and keeps the saw free from danger of breakage by overcrowding the cut. On the other hand this latter feature enables the saw to be run at a maximum rate of feed, combining safety with due efficiency.

The diameter of the saw is 13 inches and the machine has

FIG. 2.—REAR VIEW, WITH GRINDER ATTACHED.

a capacity for round bars up to 4 inches and square bars up to 4x5 inches. There is an automatic friction feed with stop motion and provision is made for a quick return of the saw by hand. The saw is driven by a phosphor bronze worm wheel and steel worm and all gears and worms are cut from the solid. There is a belt driven oil pump for lubricating the saw; the pump and metallic tube connections being shown in Fig. 1. A drip ledge surrounds the work table and there is also a large pan under the entire machine. The weight of the machine complete is 800 pounds, and the floor space over all 24x44 inches.

The Norfolk & Western has contracted for 24,000 tons of steel rails for delivery next year. Of this amount, 14,000 tons are to be rolled by Pennsylvania Steel Co. and 10,000 tons by the United States Steel Corporation.

A System for Keeping Track of Production in the Shop.

The concentration of business naturally forces manufacturers toward the production of a staple line rather than run to variety. This policy is so generally adopted that the manufacture of screws by a maker of screw machines is considerable of a rarity. This is, however, the position of the National-Acme Manufacturing Co., of Cleveland. The company makes the "Acme" multiple spindle automatic screw machines as well as set screws, cap screws, etc. There is a pronounced advantage in the present instance as the machines can be shown a prospective customer at regular work —something entirely different from the haphazard exhibition which may be given in a plant not so well equipped for screw manufacture as for the building of screw machines. The two things do not invariably reach their highest development in the one shop.

O. S. Werntz, the treasurer of the company, has applied a system of handling the product of the screw machines which has some noteworthy fetaures. On each floor of the factory where screws are produced is a sufficient number of order boards to represent the array of screw machines. The boards will individually accommodate forty machines, and one of them is illustrated in Fig. 1. It is formed of a series of light castings which are raised from the surface of the board to make a number of pockets. These are numbered

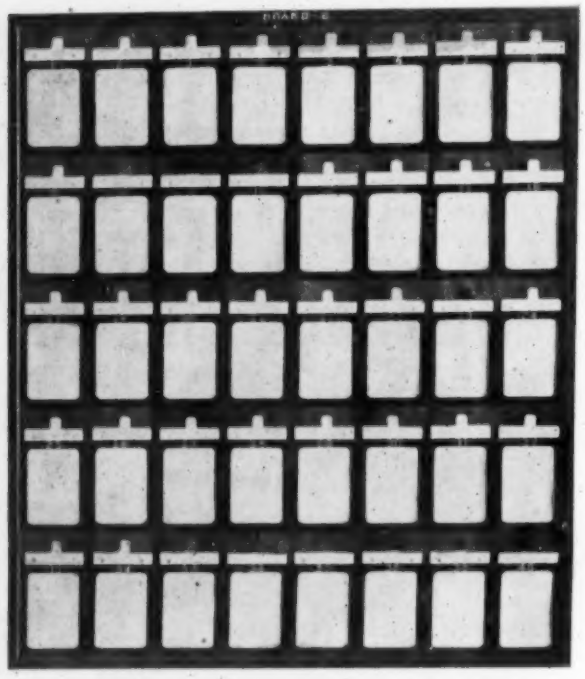


FIG. 1—ORDER BOARD SYSTEM OF NATIONAL-ACME MANUFACTURING CO.

consecutively to agree with the machines, and of course the number of boards may be easily increased to meet the added equipment of the plant. In the back of every pocket is set a stout card having riveted to its upper end a cross-shaped piece of cardboard. This four-lobed affair is capable of rotation about the paper fastener (hollow rivet) by which it is attached to the supporting card; it is about 2½ inches diameter and each of the arms of the cross is ¾ inch wide. Each arm or tab has a different color which cannot be shown other than by a slight change in the shading of the halftone, Fig. 1. The four colors are white, black, blue and red. These colors are varied to serve as an indication of the condition of the machine bearing the number of the card. For instance, a glance at the board will at once indicate the machines running in good order or waiting repairs, etc. The particular color to indicate the condition of affairs is turned uppermost. The instruction card describes the procedure necessary and is as follows.

INSTRUCTIONS.

White Tab-Designates machine running.
Black Tab—Designates machine waiting for tools.
Blue Tab—Designates machine waiting for repairs.
Red Tab—Designates machine waiting for stock or orders.

Each operator will see that the machines under his control are properly designated on the board.

When machine is running the White Tab will appear.

When a machine is down for either tools or repairs, the Tab shall be turned to so designate, Black for tools and Blue

Date 7/3/02

Office Order

Material	Size	Quality
Hex. Brass	3/8	10,950#

STOCK SENT TO MACHINE

Date	Quantity	Date	Quantity	Date	Quantity	Date	Quantity

Factory Order	Board	Machine
1589	D	3

FIG. 2.—"YELLOW" SLIP. ORIGINAL, 6½ X 4 INCHES.

for repairs, as soon as it has been reported to the foreman.

The Red Tab will be taken care of by foreman.

The order slips used in connection with the board are made in duplicate for the factory on pink and yellow forms, as

Date 7/3/02.

For Customer #10

Office Order 1050 Rated Production 8000

Material	Size	Quantity
Hex. Brass	3/8	10,950#

DESCRIPTION

Hex. Brass Nuts to sample V Thd
1,250,000 3/8x10-24

Factory Order	Operator	Machine
1589	Johnson	D-3

FIG. 3.—"PINK" SLIP. ORIGINAL, 6½ X 4 INCHES.

will be described. The yellow slip Fig, 2, is made out at the same time as the duplicate order, Fig. 3, and is a requisition on the stock house for the required rod to supply machines to execute the order in question. The office force ascertains the theoretical number of pounds of stock required to turn out the product and the material delivered to the operator must be approximately the quantitv demanded by the order slip. Of course, it is not practicable to require the stock to be

laid out exactly to a pound. The "Acme" multiple spindle screw machine takes four rods to a single load (about 40 feet of stock) and the standing order with the stock clerk is to always deliver the amount in pounds as near to the quantity named as possible and have the full complement of four rods for every load. The machine cutting up four rods simultaneously.

The yellow requisition form, Fig. 2, when returned to the office has noted on it the quantity of rod taken and no more stock can be had for use on this order without proper authority. In the event that there is any variation in the quantity of goods made from that originally ordered, an investigation can be made.

The pink slip, Fig. 3, is placed on the order board according to the machines on which the order is to be run. A separate board is assigned for each size of machine; as, for example, board "B," the one shown in the halftone, takes care of all machines known as No. 3, taking stock up to ⅞-inch diameter, so that any increase in the number of machines operating can be added without changing the general order of the layout. The orders when placed in the rack are easily read and can be kept comparatively clean,, from the fact that it is not necessary that they should be handled after once being placed on the board. One result of the method is to practically eliminate all clerical work in the factory departments.

Two of these forms are illustrated in Figs. 2 and 3 and tell their own story in regard to the order, whether stock or customer, rated capacity of the machine on that particular order and weight of rod stock necessary. These order forms are filled out on the typewriter and the amount of stock supplied from storehouse entered in bulk or installments as the case may be. In the case of a stock order to supply store of standard screws this may have no office number but will have a factory designation. As, for example, we find on one factory order: "No. 1501; 5850 lbs. ⅜ sq. iron, 100,000 ⅜x1 Cup Pt. Setscrews. V Thds. Rated production 4,000." The statement of the rated production of the machine as actually on record in the office is at once a check and an incentive to operator and foreman in rapid and continuous production.

The idea of the firm has been that the operators and foremen have frequently to consult their orders and then it is no hardship, when a machine is stopped for any cause whatever, except the grinding of tools or any similarly brief interference with the progress of the work, to have the colored tabs turned to designate the trouble. It is then an easy matter for the foreman of the room, the superintendent of screw department or the general superintendent, or any other person interested, to see when passing these boards, what proportion of the machines in the room are running or at rest, together with the reason in the event of a delay.

Lukens Iron and Steel Company.

The new steel plate mill, three high, which the Lukens Iron & Steel Co. is building at Coatesville, Pa., is expected to be the finest in equipment yet erected in this country. The chilled rolls are 140 inches long and 38 inches diameter. There are three continuous heating furnaces already completed, 9 feet wide inside and 50 feet long. The use of these furnaces will be an innovation in the practice of rolling steel plates. There will also be two modern soaking-pit furnaces of three or four holes each for heating the heaviest slabs and ingots. The mill will be in operation in October.

James Flynn, president of the Flynn & Emrich Co., Baltimore, Md., died on July 25, aged 80 years. Deceased was in the machinery business for 40 years at Baltimore and until recently the firm name was Flynn & Emrich.

The Sharon Tin Plate Co., Sharon, Pa., is operating only ten of its mills at present, but the entire 20 will be placed in operation next week.

The annual convention of the National Association of Blast Furnace Workers will be held at Buffalo, commencing the first Tuesday in October.

RAPID GROWTH OF THE FOUNDRY INDUSTRY IN 1902.

The difficulties foundries have had in securing iron for their needs in the first half of 1902 have not been due alone to the hampering of furnaces through insufficient coke supply and shortage of locomotives and cars. There has been a marked increase in the capacity to melt iron in the cupola, as the following from the *Foundry* for August indicates:

"We have previously referred to the rapid expansion of the foundry industry during the first six months of the current year. An examination of our records shows that 462 new foundries are under construction or have been projected during this period, which is equal to an increase of 7.68 percent. This covers all branches of the foundry industry in the United States and Canada, although the latter only shows an increase of a little over 2 percent. Illinois takes the lead with 47 new shops, or an increase of 11 percent, Ohio following with 53 new establishments, an increase of nearly 10 percent, while Pennsylvania, although having 75 new foundries to its credit only shows an increase of 9 percent. New York comes forward with 38 new shops, Michigan 29, Indiana 23, New Jersey, 20, Massachusetts 16, Wisconsin 15, Iowa 14, California 10, Missouri 10, Tennessee 9, Connecticut 8 and Minnesota 7. These figures while representing numbers only, and possibly not the same increase in capacity, a great part of which will not be available for months to come, still serve to indicate the activity which has prevailed in the foundry trade for some time past.

"The greatest surprise of the year comes in the large number of steel foundries that have been projected since the beginning of 1902. At that time there were 73 establishments in the United States and Canada making steel castings, this number including those using the Tropenas and similar processes. We find that exactly 20 new concerns have been organized in this branch of the trade since then, which, as far as numbers are concerned, shows an increase of over 27 percent. This is to all appearances an abnormal expansion, although it is a well known fact that the demand for steel castings is constantly increasing. The malleable industry in the first six months of the year shows 10 new shops, building or proposed, an increase of 9 percent."

American Steel Foundries Officers.

At a meeting of the new American Steel Foundries in New York Thursday last, the organization of the concern was completed. Joseph E. Schwab was elected president. The other officers are: First vice president, Daniel Eagan; second vice president, Clarence H. Howard; secretary and treasurer, F. E. Patterson, general counsel, Max Pam; executive committee, Joseph E. Schwab, chairman; Daniel Eagan, E. F. Goltra, George B. Leighton, Eben B. Thomas, Clarence H. Howard, Max Pam. Among the directors besides those who compose the executive committee are Alfred Clifford, director United States Steel Corporation; S. R. Callaway, president American Locomotive Co.; Lewis Nixon, president Crescent Shipbuilding Co., and W. K. Bixby, chairman American Car Foundry Co. Two floors of the new Arthur building, No. 74 Broadway, have been leased for the use of the new company. The constituent properties of the combine earned something like 15 percent on the preferred stock during the 12 months ended June 30. The preferred stock is to receive 6 percent dividend. The common stock is held in trust for a period of 18 months and the underwriters alone have the right of selling it during that period.

While the Amalgamated Association of Iron, Steel and Tin Workers has made gains during the past year in membership, owing to the large number of new plants that were erected, the number of mills brought under the control of the organization is very small in comparison with the number erected. The association has lodges in the following plants: Youngstown Iron Sheet & Tube Co., Youngstown, O.; American Rolling Mill Co., Middletown, O.; Parkersburg Iron & Steel Co., Parkersburg, W. Va.; Highland Iron & Steel Co., Terre Haute, Ind.; Tuscora Steel Co., Newcomerstown, O.; Waukesha Sheet Mill, Waukesha, Wis.; Eleanor Iron & Steel Co., Irwin, Pa.; Muskingum Valley Steel Co., Zanesville, O.; puddle department Colonial Steel Co., Monaca, Pa.

The Works of the Wellman-Seaver-Morgan Engineering Co.

The new plant of the Wellman-Seaver-Morgan Engineering Co., on Quincy and Giddings Ave., Cleveland, is in operation to its fullest present capacity and manufacturing is being vigorously pushed, in spite of the erection of more new buildings and the installation of equipment. We have already had some mention of the new plant and the various plans for the realization of such a modern manufacturing establishment as the experience of the company could suggest. The firm has had unusual opportunities to study machine shop requirements in the production of plants for others and it was to be expected that the present buildings and equipment would be models in their way. The plant is situated on an admirably located piece of ground and is connected by switching tracks with the main trunk lines entering the city, affording the best shipping facilities. The site selected is of ample size not only for the present needs but for future extensions.

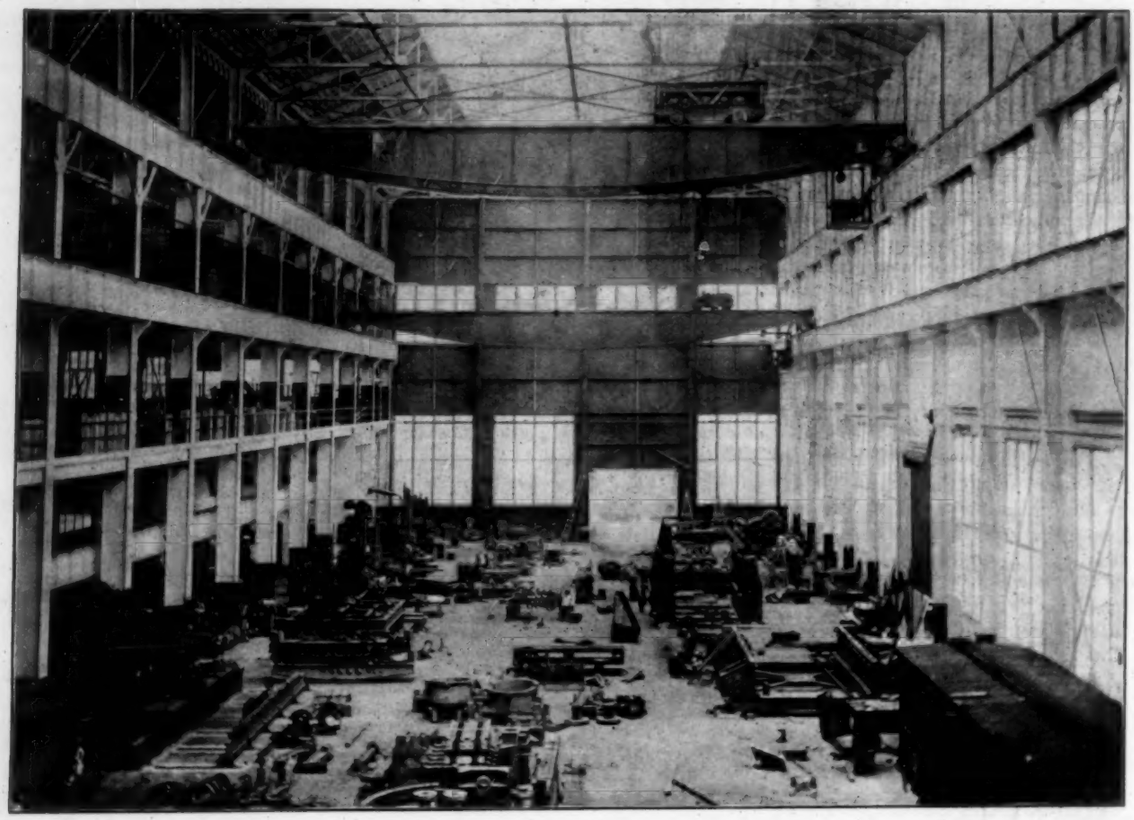


FIG. 1.—A PART OF THE MAIN FLOOR OF THE ERECTING AND MACHINE DEPARTMENTS.

Fig. 1 is a view of the main erecting and machine shop and it affords some idea of the great height of the structure, the wide span of the main roof, the great amount of light available from the windows in walls and roof as well as the solidity and permanence of the buildings. The main erecting and machine shop consists of one central span, 80 feet wide in the clear and 69 feet high from floor to the underside of the roof trusses. Extending along one side are two gallery floors, each 45 feet wide, which with the ground floor under the galleries gives three side floors. The main or 80-foot span is commanded by 50- and 10-ton cranes. The heavy cranes traverse upon runways immediately under the roof trusses, and the light cranes upon runways directly beneath those of the heavy cranes. This allows of an independent movement as well as a combination of all the cranes and gives a very convenient arrangement for erecting work, placing the material on the heavy tools and handling it when in course of erection on the floor. Tracks are laid along the shop, as indicated by the position in which the car stands at the right of the halftone, and another track crosses this at right angles passing through the doorway shown midway of the building. At the end of each of these tracks is laid in the floor a suitable block and sheave from which a rope may be led to a car outside the building as well as upward to the crane overhead. In this way a car may be drawn into the shop from the tracks outside the building. The block rests in an opening in the floor which is covered when not in use. The floor of the erecting room is paved with wooden blocks, about 5x4x7 inches which are set edgewise. At the present time one end of the main building is closed by a temporary wall which will later be torn down and the structure extended.

One of the side spans is illustrated in Fig. 2. This manufacturing department is commanded by 10-ton cranes and the second floor immediately above is reserved for the use of medium and light tools and is served by portable cranes. The third floor is occupied by the Electric Controller & Supply Co., an organization closely affiliated with the Wellman-Seaver-Morgan Engineering Co.

The heaviest tools are located underneath the main span at one end of the shop, as illustrated in Fig. 1, and on the first floor under the side spans are the medium weight tools. The machine tools have been designed of specially heavy construction to suit the latest requirements in high speeds and heavy service made possible by the recent developments in tool steel manufacture. They are equipped with individual variable speed electric motor drives, there being an entire absence of belting and shafting in the shop. There is also a noticeable absence of wiring, the mains being run in conduits laid beneath the floor and connected to the machines by branch lines.

The construction of the machine and erection shops through-

out is strictly fireproof, the main framework being of structural steel with brick curtain walls and tile roofs. The gallery walls are of steel and concrete construction. The windows and skylights are fitted with ribbed glass producing an excellent diffused light. Special provision has been made for the heating and ventilating of the shops by means of the Sturtevant hot air system. The ducts for the passage of the air are of heavy brick construction and located beneath the main floors. The main conduits run longitudinally of the shops with transverse ducts to the side walls.

Great pains have been taken to ensure the comfort and convenience of the employes and a dining hall is to be under way as soon as the draftsmen who now occupy the room can be moved into the mammoth office building. The latter will be rushed up to the nine stories at present contemplated but plans are made for a 15-story structure, and the additional floors are to be completed as soon as time and trade dictate. The toilet room on the third floor is illustrated in Fig. 3. This is the smallest of the several rooms assigned for the purpose on the different floors and was selected on account of the greater ease with which the photographer could embody the features of interest in the one view. The toilet rooms are provided with the best sanitary appliances. The lockers seen on the extreme right of the illustration are metal throughout and largely constructed of latticework, the open construction not only ensuring ventilation but being an incentive to cleanly and orderly habits as the open locker tells a suggestive story. The washing facilities

FIG. 2.—ONE OF THE MANUFACTURING DEPARTMENTS.

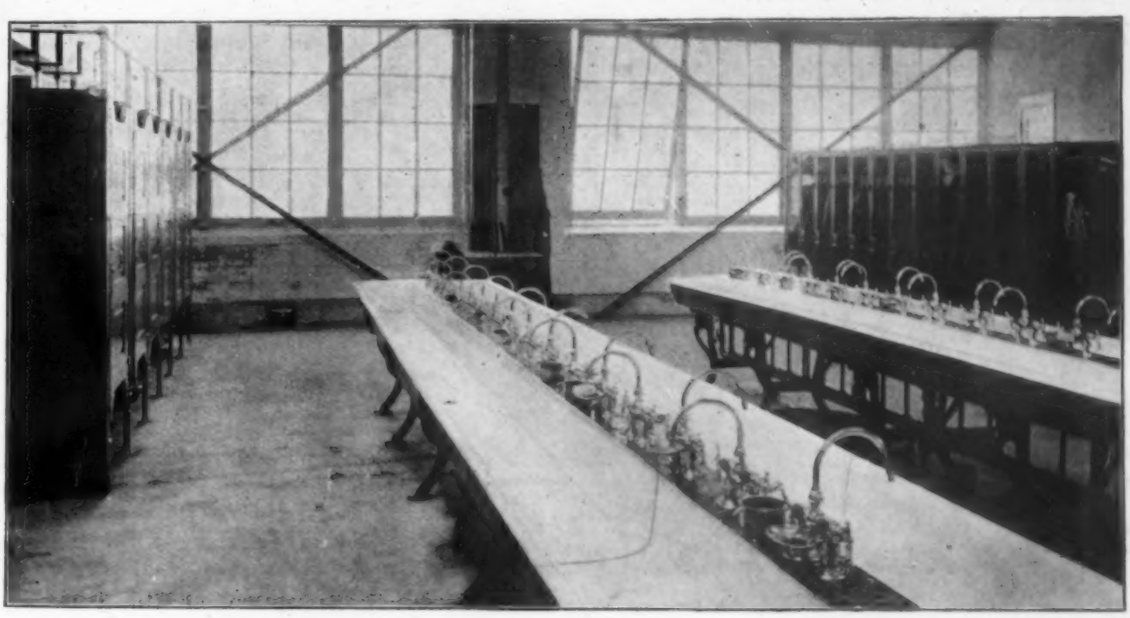


FIG. 3.—A VIEW OF A WASHROOM.

are extremely good. A twin connection to each nozzle supplies hot as well as cold water and the stream at the outlet may be nicely graduated to the temperature desired by the individual workman. It is intended that the outlet to the sink shall be kept open at all times, a sanitary provision that will doubtless receive general approval.

The power building is also strictly fireproof and here are located the electric generators for power and light. These are planned in duplicate units, insuring continuous operation. The electric power consists of both the direct and alternating currents, so that machinery built for either type can be thoroughly tested before shipment. The units consist of a 325 horsepower tandem compound Buckeye engine at 185 revolutions per minute. This is direct connected to a 250 kilowatt Westinghouse generator operating at a voltage of 225. The electrical apparatus is operated on the three-wire system. Another engine of 500 horsepower directed connected to a 350 kilowatt generator will be installed at an early date. The boiler house has an equipment of 250 horsepower Babcock & Wilcox safety water tube boilers fitted with Aultman-Taylor mechanical stokers. A conveyor takes the ashes and deposits them in cars on the tracks outside the building.

The forge shop is adequately equipped with steam hammers, cranes, forges and other appliances for the economical handling of the work.

The pattern shop is 50 feet wide and 165 feet long and is of brick and wood construction. The building is thoroughly equipped with automatic sprinklers and other modern appliances for fire protection. The structure is three stories in height, the patternmakers occupying the first or main floor and the two upper stories being used for the storage of patterns. One of these storage sections is seen in Fig. 4. This department is used for the housing of the smaller patterns which are located by sections and shelf number. The shelves are fastened by pegs permitting a ready method of increasing or decreasing the distance between them as required for the storage of patterns of unusual size. The building is equipped with the very latest pattern-making tools, all electrically driven.

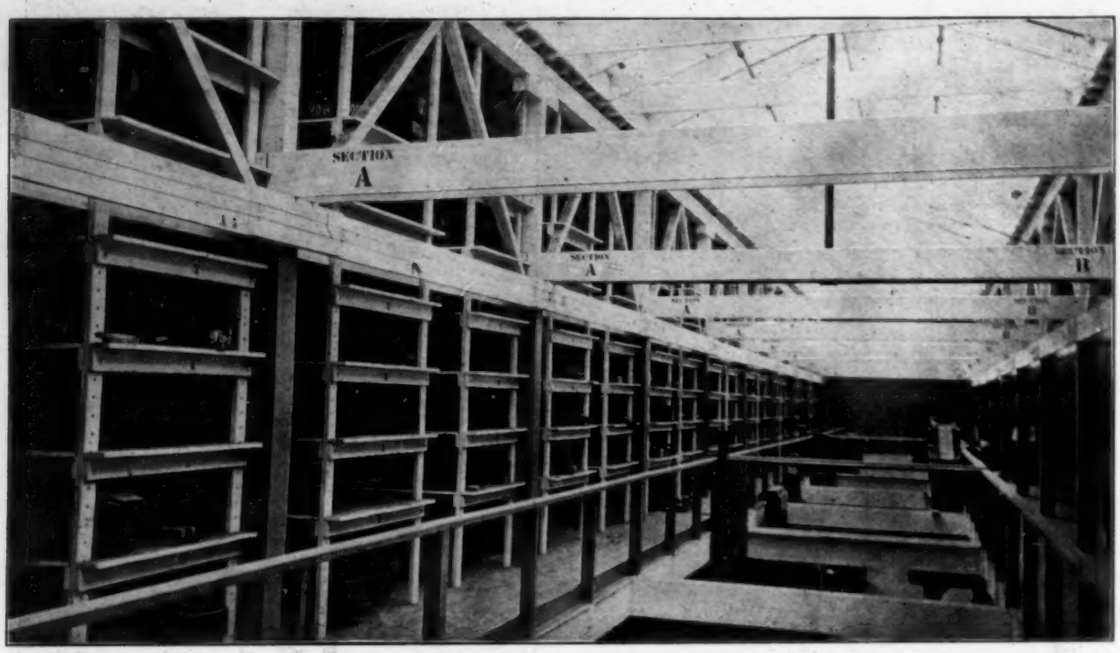
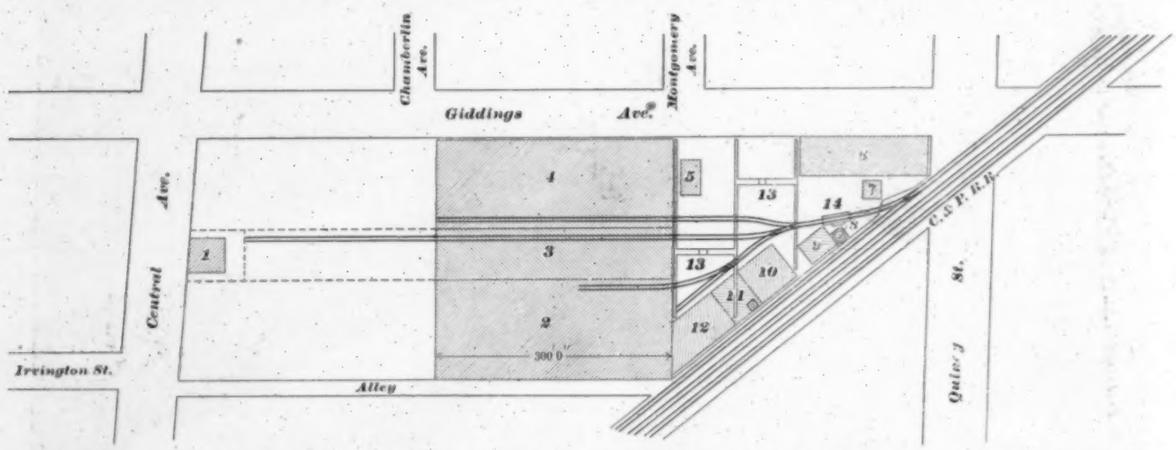


FIG. 4.—A SECTION OF THE PATTERN STORAGE.

Fig. 5 shows the plan and location of the plant, and in passing it may be said that the works are easily reached by the two lines of electric cars which traverse Central Ave. and Quincy St. The dotted lines in Fig. 5 show the probable extension of the main buildings. Fig. 6 is a general section through the main buildings; looking toward the office. The smaller buildings are seen in section in Fig. 7 whilst Fig. 8 illustrates a portion of the yard.



1.—Office Building. 2.—Machine Shop. 3.—Structural Shop. 4.—Foundry. 5.—Gas House. 6.—Pattern Shop. 7.—Lumber House. 8.—Water Tank. 9.—Paint House. 10.—Blacksmith Shop. 11.—Boiler House. 12.—Engine and Fan Room. 13.—Yard Cranes. 14.—Scales and Scale House.

FIG. 5.—PLAN AND LOCATION OF PLANT.

Work is well under way for the large combination iron and steel foundry which will be provided with special facilities for the turning out of exceptionably heavy castings. This building

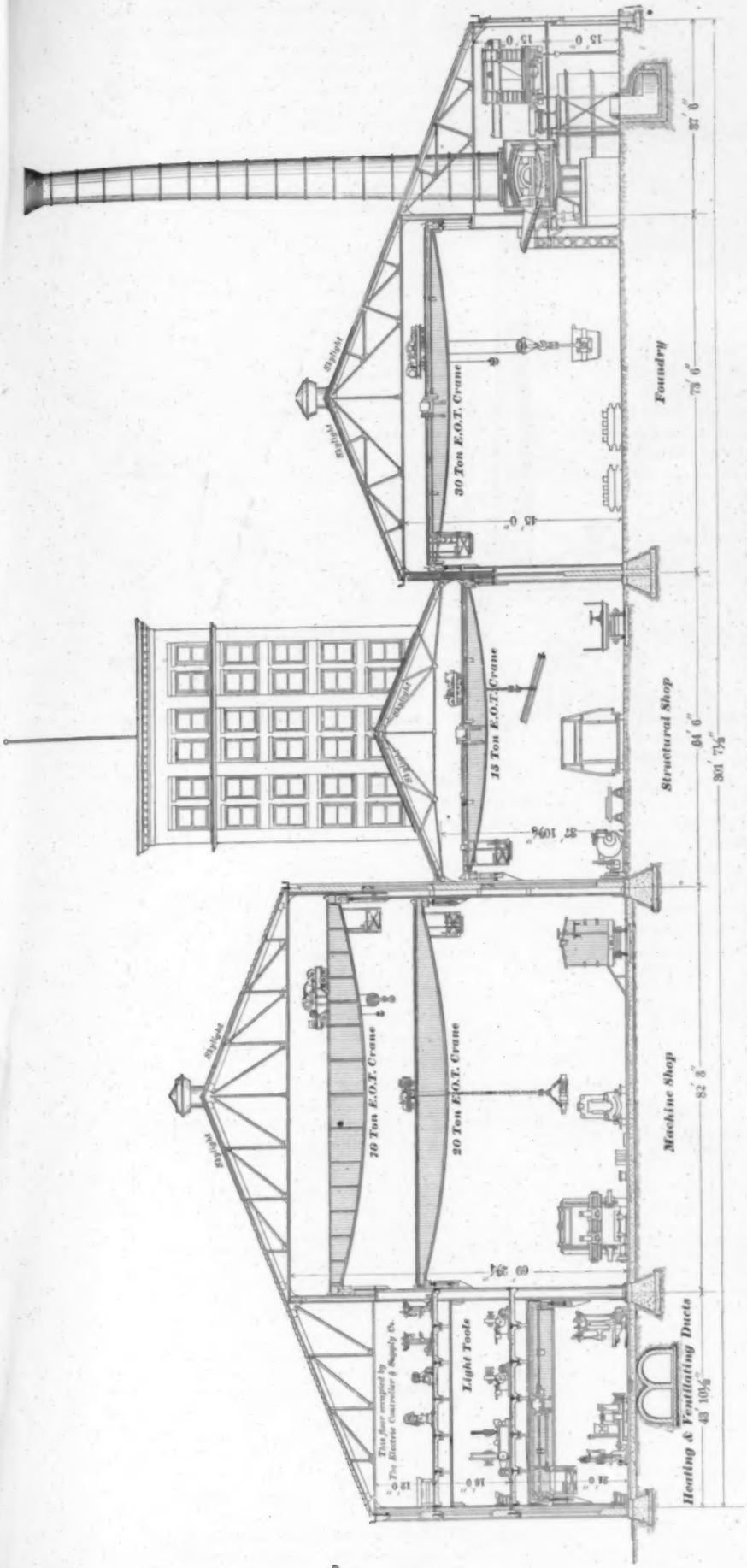


FIG. 6.—GENERAL SECTIONAL ELEVATION THROUGH PLANT. OFFICE BUILDING IN THE REAR.

and the storage structure which comes between the foundry and the main machine shops to be provided with crane service of the most approved type. One crane is already in position in the yard handling shapes, etc., but this space will be roofed in and used as a general storehouse for material needed for the special cranes, charging machines, charging cars and boxes, gas producers, valves, open-hearth and other furnaces, etc., made by the firm.

The management of the works will be under the direct charge of Mr. Thomas R. Morgan, secretary and works manager. It was in recognition of Mr. Morgan's ability and services to the company that the name of the firm was changed in March from the Wellman-Seaver Engineering Co. to the Wellman-Seaver-Morgan Engineering Co. Mr. Morgan has spent his whole life with machine shop and engineering work, has had experience commencing at the very bottom of the ladder and thence to the general managership, so that his direction of this magnificent plant will stand for superior workmanship and careful attention to every detail of the finished product. Mr. W. G. Hildebran is assistant works manager. All work will be turned out under a strict system of inspection and the manufacture of machinery carried on in accordance with the latest ideas in regard to interchangeability, being as far as possible from jigs and templates finished to fixed standards.

The cranes of the plant are particularly noteworthy in height and span. One of them will cover the switching tracks and connections and will have a span of 120 feet. The crane service is well shown in the various illustrations and the exhibit in the shops and yard at the works is expressive of the faith in the firm in the advantages of saving all the time possible in the ready handling of material by means of a goodly supply of crane conveniences.

Muskingum Valley Steel Co.

The Muskingum Valley Steel Co., of Zanesville, O., has just completed the erection of additions to its buildings, extending them 66 feet in length and 16 feet in width. There have been installed one new 26x40-inch hot mill with combination sheet and pair furnace in connection and one new double annealing furnace and a new billet heating furnace; also an additional stand of cold rolls. This equipment will increase the output of black sheets by 25 percent and the output of sheet bars from billets 100 percent, or an increased production of about 750 tons of sheet bars and 250 tons of black sheets a month. In addition the company is about to install a galvanizing department with a capacity of 25 tons a day. The mills and other equipment have been recently overhauled and the plant is now turning out promptly standard sizes and gauges of black sheets, corrugated, V crimp, roll and pressed standing seam painted roofing, brick siding, etc., and upon installation of the pickling and galvanizing departments will add to its finishing facilities the finer grades, including pickled and cold rolled and polished sheets.

PERSONAL.

Werner Gurlitt, until recently connected with the Wellman-Seaver-Morgan Engineering Co., of Cleveland, and formerly with the Carnegie Steel Co., at Pittsburg, has been appointed chief engineer of the International Power Co., of Sault Ste. Marie, Mich.

C. Mercarder, employed in the capacity of special engineer by the Carnegie Steel Co., sailed for Europe this week on business as a special representative of the United States Steel Corporation.

Samuel Benner, connected with the sales department of the Carnegie Steel Co., Pittsburg, has been appointed president of one of the subsidiary companies of the International Nickel Co., of New York. Mr. Benner represented the Carnegie Steel Co. in Mexico and South America for some time and is the second official of the Carnegie Steel Co. to secure a high position with the International Nickel Co. Ambrose Monell, steel expert, formerly in the employ of the Carnegie is president of the Nickel consolidation.

George L. Collard, of Pittsburg, formerly superintendent of the furnaces of the Shenango Furnace Co., Sharpsville, Pa., has resigned to become superintendent of the three furnaces of the Clairton Steel Co., Clairton, Pa. George D. Devitt, for 20 years superintendent of the Mabel Furnace at Sharpsville, has been appointed Mr. Collard's successor.

P. T. Berg, chief engineer of the Homestead Steel Works of the Carnegie Steel Co.; E. F. Wood, assistant superintendent of the same plant, and G. K. Hampfeldt, superintendent of the Carrie Furnace plant of the same company, are spending the summer at Asbury Park, N. J.

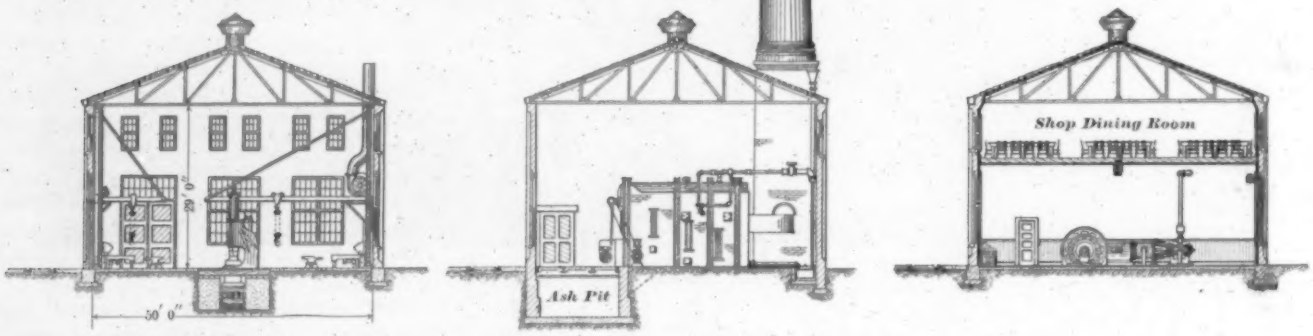
L. W. Powell, formerly title agent of the Oliver Iron Mining Co. and the Minnesota Iron Co., with headquarters at Duluth, has been appointed assistant to President Thomas F. Cole.

Some changes in the bureau of inspection of the United States Government have been made at the Homestead Steel Works of the Carnegie Steel Co., Homestead, Pa. Charles H. Davis, formerly civil engineer of the Baltimore & Ohio Railroad, has been appointed assistant chief inspector of hull material and George H. Stevenson has been made his assistant. J. C. Wickersham, of Steelton, Pa., has been added to the corps of inspectors at the Union mills. The Government now has three bureaus at the Carnegie plants.

John J. Utech, private secretary to superintendent A. R. Hunt, of the Duquesne plant of the Carnegie Steel Co., has resigned to accept a similar position under Joseph E. Schwab, who was recently elected president of the American Steel Foundries of New York.

President J. W. Duntley, of the Chicago Pneumatic Tool Co., accompanied by J. P. O'Donnell of the International Pneumatic Tool Co., returned to Chicago last week from a trip to Europe. President Duntley will shortly return to Europe for the purpose of completing the consolidation of the British company with the Chicago concern.

J. E. Simons, who until recently was superintendent of rolling stock and machinery of the Pittsburg Coal Co., Pittsburg, has been elected treasurer and general manager of the Hunt Foundry & Machine Co., of Pittsburg, a reorganization of the Hunt Air Brake Co.



Blacksmith Shop. Boiler House. Engine Room.

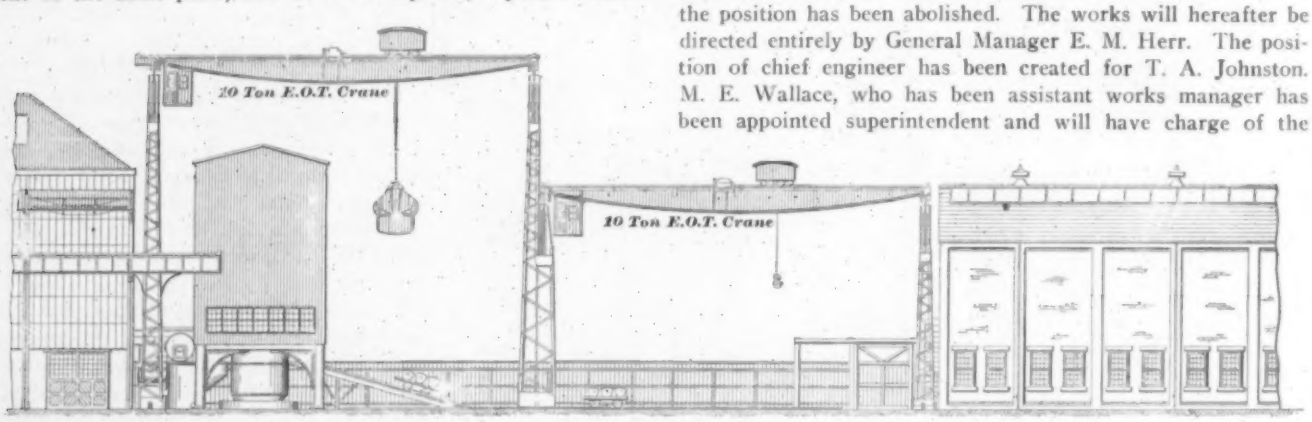
FIG. 7.—SECTIONAL ELEVATION OF SMALLER BUILDINGS.

A. H. Garry, heretofore chief accountant of the Cleveland District, American Steel & Wire Co., has been made assistant auditor of the company, with headquarters in Cleveland.

T. R. Brown has resigned as works manager of the Wilmerding Paper plant of the Westinghouse Air Brake Co., and the position has been abolished. The works will hereafter be directed entirely by General Manager E. M. Herr. The position of chief engineer has been created for T. A. Johnston. M. E. Wallace, who has been assistant works manager has been appointed superintendent and will have charge of the machine shop. S. D. Sleeth has been appointed superintendent of all foundries and his assistant will be Thomas Campbell. J. B. Brooks will be superintendent of construction and John R. Rankin has been appointed superintendent of production and storekeeper.

W. C. Reilly, auditor and acting superintendent of the Youngstown Iron Sheet & Tube Co., Youngstown, O., has been made general superintendent of the plant.

Charles M. Schwab, president of the United States Steel Corporation, accompanied by Mrs. Schwab, went to their sum-



Foundry. Gas House. Stockyard. Pattern Shop.

FIG. 8.—SECTION OF YARD SHOWING CRANES, GAS HOUSE, ETC.

mer cottage at Loretto, Pa., last week. Mr. Schwab will remain there until he recovers completely from his indisposition when he will return to Atlantic City for the remainder of the summer.

H. G. Dalton, of Pickands, Mather & Co., Cleveland, has returned from an extended sojourn in Europe.

The Scale in American Steel Hoop Co. Mills.

A conference was held last week at the Hotel Lincoln, Pittsburg, between officials of the American Steel Hoop Co. and of the Amalgamated Association for the purpose of rearranging the footnotes of the scale as adopted by the Republic Iron & Steel Co. to suit the improved mills in operation by the American Steel Hoop Co. A proposition was agreed upon at this meeting which has been referred to the lodges directly interested, and if they accept the entire scale matter will be closed with the American Steel Hoop Co. The notes in dispute are as follows:

"Finishing mills will be allowed to work three turns when practicable. On finishing mills working or desiring to work three turns, eight hours shall constitute a day's work. Rolling shall not start earlier than 5 a. m. Monday morning, and first furnace shall cease charging at 11:30 a. m. on Saturday. The last furnace shall not charge later than one (1) hour after the first furnace, and close the week's work. On all mills working three turns, a third roller shall be employed.

"All 10-inch guide and hook mills with one furnace averaging $35 per turn or more, or with two furnaces $65 per turn or more on a 9¼-hour system, based on a one-cent card rate, the 8-hour system shall be adopted. On bar and 12-inch mills averaging 60,000 pounds on one (1) furnace and 85,000 pounds on two (2) furnaces per turn on the 9¼-hour system, the 8 hour system shall be adopted."

Bessemer Plant for the Deering Harvester Co.

The Deering Harvester Co., Chicago, Ill., has decided to erect a Bessemer steel plant instead of an open-hearth plant, although the plans for the latter had been nearly prepared. It has been decided to install two 10-ton converters with a capacity of about 400 tons of steel per day. Two cupolas will also be installed for melting the iron for the converters, as the direct process will not be used. The converters will be operated only one turn, and it is probable that only one converter will be operated at a time, the additional converter being provided against emergency. The company will not roll any steel for the open market, but will make all the finished steel used in its agricultural plants. This is the only company in the country that has decided upon the erection of a Bessemer plant in preference to the open-hearth.

New Youngstown, O., Bessemer Steel Plant.

It is reliably reported from Youngstown, O., that nearly all the money has been subscribed for the new steel plant to be erected there by well known iron men of that district. It is altogether probable that the company will take over three or four of the merchant furnaces so that the supply of raw material will be assured. It has been practically decided to erect a two converter Bessemer plant together with blooming mills and finishing mills, but plans has not yet been prepared. Julian Kennedy, of Pittsburg, has been retained as the engineer. The name of the new company has not yet been decided upon.

The Allegheny Steel & Iron Co., Pittsburg, Pa., has made a conversion arrangement with the Tuscora Steel Co., of Newcomerstown, O., whereby the former furnishes sheet bars for conversion into sheets and also disposes of the latter, the price of rolling the sheets being paid the Newcomerstown concern. Two sheet mills are running at the present time and two additional mills will be placed in operation later. About 125 tons of sheet bars are delivered weekly by the Allegheny Iron & Steel Co. This concern reports that owing to the large demand for its products it was found desirable to enter into this arrangement.

The Warren, O., plant of the National Tube Co., which has been idle for nearly two years, has been ordered dismantled.

CHICAGO BOILER-MAKERS' STRIKE.

CHICAGO, Aug. 5.—Several hundred boiler makers and their helpers employed in shops in this city have gone on strike for an increase in pay and a nine-hour day. The strikers' demands are as follows: Journeymen, increase in wages from 30 to 35 cents an hour for work in shops; 50 cents an hour for outside work. Helpers, 25 cents an hour for inside work and 30 cents an hour for work outside the shop. Nine hours to constitute a day's work. Double pay for Sundays and holidays. No work on labor day. Outside work to consist of eight hours a day, with double pay for all overtime. Recognition of the union. No work with nonunion men. Shop committees to see that the rules of union are carried out. The union also demands that each individual concern shall sign the scale, instead of permitting the Boiler Manufacturers' Association to sign for one or more of its members.

The strike is not a general one, as many concerns signed the scale when it was presented to them on July 12, and only a few shops are affected. A few of these have signed since the strike was declared. These manufacturers offered in lieu of the scale presented, a 5 percent horizontal increase, stating that if they met the demands of the union they would be unable to meet the competition of manufacturers in other cities. Most of the strikers, it is stated, are leaving town, having been offered positions elsewhere. Chairman Frederick W. Job, of the state board of arbitration, is endeavoring to settle the strike by arbitration, and has called a meeting of the manufacturers and strikers for this purpose. It is not expected the trouble will be prolonged.

Statistical Charts of R. G. Beker.

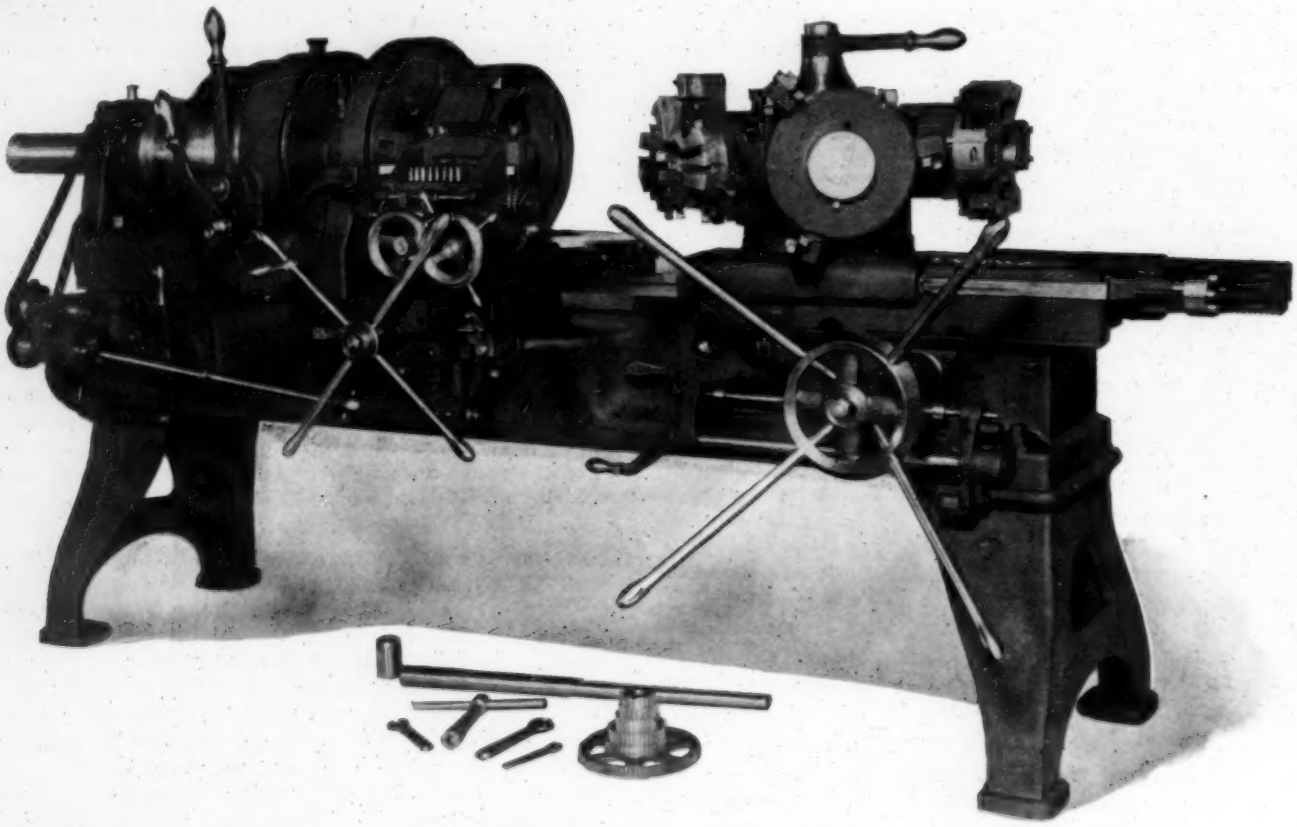
R. G. Beker, engineer, Frick Building, Pittsburg, has published a series of five charts, exhibiting in a graphic way the iron ore, coal, pig iron and steel production of the United States and other leading iron-producing countries. All are 20x28 inches and are on heavy white paper. The plotted curves and heavy black columns representing the production of various materials in gross tons are based on official statistics. The pig iron production of the United States goes back to 1820, and the advance from 150,000 tons in 1830 to more than 15,000,000 tons in 1901 is shown in a striking way. The pig iron production of other countries in 1900 and for various States in the United States, together with the furnace capacity of leading producers, appear on one chart. Another shows the iron ore production in the United States in 1901 and in other countries in 1900, and the production of the various Lake Superior ranges and of important industrial mines in 1901. A third chart is given up to coal and coke production in the United States since 1880, the world's coal production in 1900 by countries and the coal production by States in 1900. The steel production in the United States, Bessemer and open-hearth, since 1885 is shown on a separate sheet, also the world's production of steel by countries in 1900. A fifth chart takes up various lines of finished iron and steel and shows the output in the United States over a period of years. The charts are exceedingly valuable and represent a vast amount of painstaking labor. The price is $1.25 each.

Julian Kennedy, of Pittsburg, is at present consulting and contracting engineer for eleven blast furnaces under construction in this country, and is also in charge of the erection of a number of steel plants. He has the following work in charge: Clairton Steel Co., Clairton, Pa., three blast furnaces, and steel works; Buffalo & Susquehanna Iron Co., Buffalo, two blast furnaces; Pittsburg & Rochester Coal Co., one blast furnace at DuBois, Pa.; Cleveland Furnace Co., one blast furnace at Cleveland, O.; Toledo Furnace Co., Toledo, O., one furnace; South Chicago Furnace Co., Chicago, one furnace; Deering Harvester Co., Chicago, Bessemer plant, blooming mill and finishing mills; Spang, Chalfant & Co., Pittsburg, pipe mill; Colonial Steel Co., Pittsburg, crucible steel works, including melting and puddling furnaces, finishing mills and hammers, in almost complete operation; Union Steel Co., Donora, Pa., two blast furnaces; Bessemer plant, blooming mill and finishing mills for new steel company now being organized at Youngstown, O.; power plant for Henry Phipps, Pittsburg, new office building.

MACHINING CLUTCH PULLEYS IN A MODERN PLANT.

The example of turret or monitor lathe work given in the present article is interesting as showing the development of shop facilities compared to the old time methods. Pulley turning was always a slow and wearisome task. The material was usually hard and thin and would vibrate easily, causing the wavy "chatter" ridges to develop in spite of almost every attempt at a smooth piece of work. The work was a tax upon the shop inventiveness and sorely tried both craftsmen and management. For these reasons it will be of valuc to show how one firm has made the once tiresome task a pleasant and profitable operation.

The machine tool is shown in the illustration is a turret lathe in the plant of the Garvin Machine Co., of New York. The tool is especially fitted for the production of the countershaft pulleys sent out with their make of lathes, and these are manufactured in sufficient quantities to require the duplication of the parts in interchangeable style. The clutch pulley, which is the particular product of this machine, has several operations to be performed. For instance, the rim is faced on each edge and the inside of the rim is turned out on a slight taper to form the frictional surface of the clutch.



HEAVY TURRET LATHE FOR MACHINING PULLEYS.

The face of the pulley is turned, crowned and finished. The hub is faced at the one end and the hole is bored and reamed to size. The pulley is shown in the chuck in the illustration, and a consideration of the work will easily convince the reader that a portion of the interior surface of the rim, the arms and one-half of the hub, are available for gripping or any other purpose, as the remainder of the surface is to be finished and economy of time demands that all this be done without taking the work out of the chuck.

The designer of the tools felt the necessity of utilizing each of the unfinished parts in order that the pulley could be readily and solidly chucked, and an examination of the halftone will disclose some unusual features in the chuck. Each of the pulley arms rests against a piece projecting from the face of the chuck and these lugs are machined on their outer ends. Other pieces locate the interior of the rim, and thus the work can be placed against the chuck and centered without delay. Three screws bear against the hub and an equal number of hook bolts are forced into position to grip the arms of the pulley and draw them tightly against the faced projections on the chuck. These hook bolts are moved in or out by means of wedges and screws.

The cross slide has a multiple holder containing a set of half a dozen roughing tools together with two side tools for finishing the edges of the rim. These tools are held in the casting on the cross slide and are fed in and then given a slight sidewise motion which puts the surface in good condition for the finishing chip. Each of these tools is held by its own setscrew and any one of them may be readily removed for sharpening or other adjustment. The operating handles are brought to the front of the machine and the roughing tools are set in a curve to enable the work of the finished chip to be more evenly distributed over the surface of the forming cutter.

The finishing tool is placed at the back of the carriage on the cross slide; the cutter being formed to give the shape of the crowned surface and the end of the tool cut at an angle to produce a shearing action. The cutter is tilted at a slight angle and on being pulled through by the cross feed the tool works with a steady shaving cut which speedily brings the pulley face to correct form. The manner in which the forming cutter is held and tilted will be easily seen from the haif tone.

The hub is faced by a combination tool which has previously bored the hole out with a single cutter. The reamer finishes the hole and then the clutch surface is finished by the turret tools held in the massive holders illustrated. The grooves in the holders are planed to the correct angle, so that the tools may be conveniently replaced after sharpening, or removal for any other purpose.

Jessop Steel Company.

The crucible steel plant of the Jessop Steel Co. at Washington, Pa., which will probably be ready for operation late in September, consists of the following: Crucible melting shop, a steel structure, 110x225 feet, containing three 36-pot furnaces. Rolling mill, a steel building, 110x270 feet, containing a 24-inch mill and a 20-inch mill, with two direct connected Lane & Bodley condensing engines, and eight heating furnaces. A power house 60x100 feet, of brick and steel, containing 1,000-h. p. Babcock & Wilcox boilers, two 125-h. p. Westinghouse gas engines, two 75-kilowatt Westinghouse generators and an air compressor. The buildings are fully equipped with electric cranes and electrical driving machinery for small work. The mechanical engineer is H. G. Manning and the contractor, Jas. J. Mahon.

A NEW FULL UNIVERSAL RADIAL DRILL.

In the accompanying engraving is illustrated the latest full universal radial drill brought out by the American Tool Works Co., of Cincinnati. The element of strength has received careful treatment in the design and construction of these machines. With that end in view the column has been made unusually large and is firmly supported by an inside stationary stump extending its entire height with a bearing at the top. The arm is of a design permitting of all lower driving gears being brought direct to central driving shafts through the medium of bevel gears mounted on a vertical shaft and enclosed in the arm. It is raised and lowered rapidly by a double thread coarse pitch screw running in a bronze nut directly on the load line, reducing friction to a minimum.

The head is universal in its action and is clamped in any posiiton instantly by means of fixed binders at the top. Movement along the arm is controlled by a hand wheel through rack and multiple gearing. The spindle has three changes of feed, sixteen changes of speed, back gears being located on the arm and these can be thrown in or out by a lever while the spindle is in motion. The correct vertical position of the spindle is determined by a dowel-pin in the head, insuring accuracy of alignment with the platen.

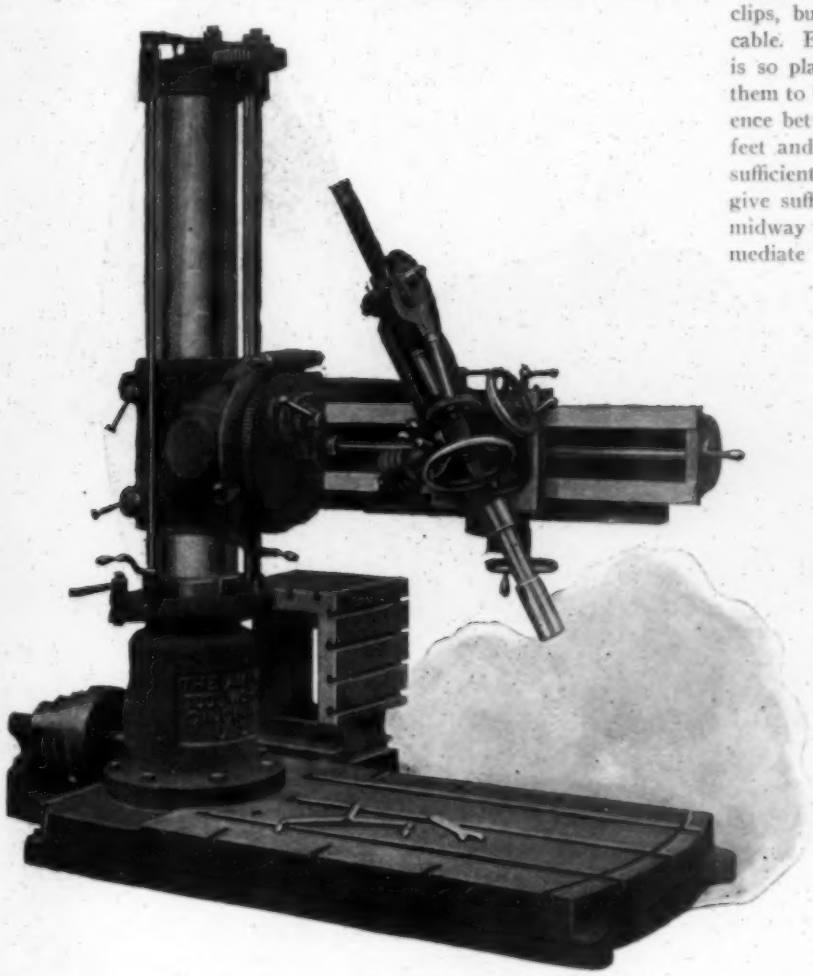


FIG. 1.—NEW FULL UNIVERSAL RADIAL DRILL.

The use of the tapping attachment is of importance. By means of a patented friction located in the arm the tap can be advanced to the required depth, the lever thrown instantly without the operator leaving his position, the spindle reversed and the tap backed out at an accelerated speed by throwing from gears-in to gears-out. The motion of the spindle can be stopped instantly either by the lever controlling the back gear or the lever controlling the friction, thus obviating all necessity of stopping the entire machine through the countershaft.

Rapid progress is being made on the erection of the new plant of the American Tube & Stamping Co., Bridgeport, Conn. The main building that will contain the rolling mills and open-hearth plant will be 610 feet long and 110 feet wide. The machine shop will be 450x90 feet.

A NOTEWORTHY ROPE HAULAGE SYSTEM.

A Leschen & Sons Rope Co., of St. Louis, has built a conveying system 4,200 feet long, extending from the works of the American Gold Mining Co., of Deep Gulch, some 2,000 feet up to the mouth of the mine in the Rocky Mountains of Colorado. The line consists of two stationary cables secured by anchors at each end. The loaded buckets run on a rope 1⅛-inch in diameter, whilst the empties return on a 1-inch rope. The buckets are propelled by an endless steel wire rope ¾ inch in diameter. This rope passes around one 8-foot sheave at both the terminals of the line, the one at the mine having a number of grips which clamp the rope tightly and afford the means to control the speed of the tramway when in operation. The brake bands for stopping the tramway or controlling it are attached to this wheel. The buckets are attached and detached automatically to and from the traction cable by means of patent clips, button shaped, which are permanently attached to the cable. Each of the buckets has a capacity of 6½ cubic feet and is so placed in the pendant as to swing freely, thus allowing them to be dumped at the lower station of the line. The difference between the two terminals of the tramway is about 2,000 feet and the weight of the loaded buckets traveling down is sufficient to operate the tramway by gravity and in addition give sufficient force to bring supplies up to the mine. About midway of this tramway is placed what is known as the intermediate station so designed that later on it can be used for loading ore from another mine located near by. The tramway at its lower portion has a single span 2,100 feet long. When a bucket enters the upper terminal it is automatically detached from the traction rope and its momentum is overcome gradually until it is placed in the loading position. After it is loaded it receives an acceleration to overcome its inertia and is then again attached to the line automatically and travels to the lower terminal. The same operation occurs at the lower terminal and in addition the bucket is automatically dumped by means of a frame connected with the terminal shaft. As soon as the bucket enters this terminal and before it is discharged it is weighed automatically by a special scale. The A. Leschen & Sons Rope Co. is now building a tramway of this type at Encampment, Wyo., which will be 16 miles long.

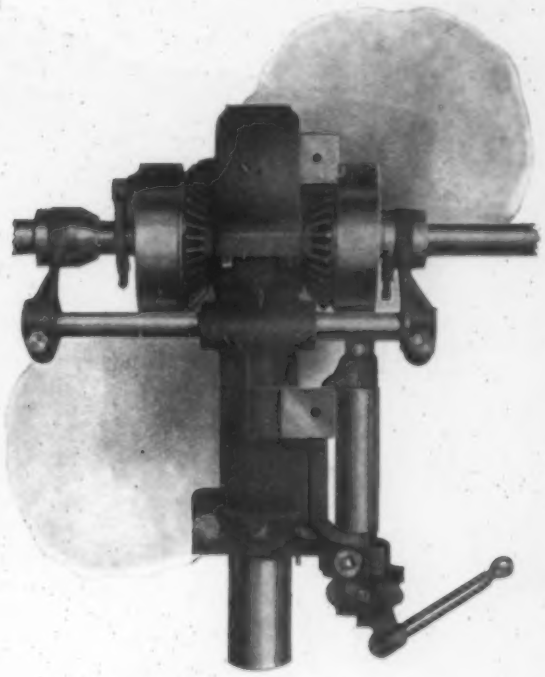


FIG. 2.—TAPPING ATTACHMENT.

The Riverside Bridge Co., of Wheeling, W. Va., has commenced the erection of its new structural plant at Wheeling. The buildings located on the site are being razed and the erection of the plant will be hurried as speedily as possible.

The Leetonia Tool Co., Salem, O., will start its works at once, occupying the old Boyle & Carsey stove works.

A FOUR-INCH UPSETTING AND FORGING MACHINE.

The 4-inch upsetting and forging machine illustrated in Fig. 1 has been designed to meet the requirements of locomotive builders, car builders and other users of heavy forgings where the constantly increasing size of their product has necessarily made all of the parts entering into it also much larger. The machine has a bed that is a single steel casting, weighing 18½ tons, and giving the strength of a cast iron bed of four times the weight. The shaft is a fluid compressed steel forging. The grip slide, toggle head and moving die block are steel castings and the toggle links are heavy tool steel forgings hardened. These links are four in number so that the die block moves to its place in closing with a perfectly even motion, no matter whether the dies are at either extremity of the die block. This is of great importance in forging close to size, because so wide a die block, about 2 feet, if moved with a single pair of links, when the dies were at one end of the block, would be very apt to close the dies unevenly. The arrangement of links, etc., is shown in Fig. 2. The mechanism that closes the dies is designed to give the very largest possible measure of "time"—that is, the time the dies remain closed with reference to the advance of the upsetting plunger. This advance is known among mechanics familiar with these machines as "gather." This in plain terms means that the dies act quickly enough so that after they are firmly closed, and that the plunger has as long a distance to travel as it is possible to get, because it is desirable that the plunger travel as far as it is possible and still have the piece being upset carry straight as the upsetting begins after the dies are closed.

The machine is able to give a plunger pressure of 100 tons and to give a die pressure of 65 tons before the automatic relief becomes operative. This automatic relief is of a new construction (on which the company has already been granted a patent) and is illustrated in Fig. 3. A spring of not very large dimensions is so placed that when there is only about 10,000 pounds pressure on the spring, it exerts a pressure through the dies of 65 tons. With any pressure in excess of this, of course the spring yields and the machine is instantly relieved. The peculiar arrangement of the links of the toggle and spring connection will be readily understood on reference to Fig. 4. The action of the spring on the short end of the lever being at variance with the first impression which the average designer would probably obtain as to the most evident way of reaching the desired result. The design is not only novel but neat and highly effective.

The factor of safety throughout is 15 and altogether the builders believe that it is one of the most powerful mechanical upsetters ever constructed, at least so far as they have any knowledge, without regard to the rating of such upsetters. The machine is a recent addition to the line of heavy tools made by the Acme Machinery Co. of Cleveland.

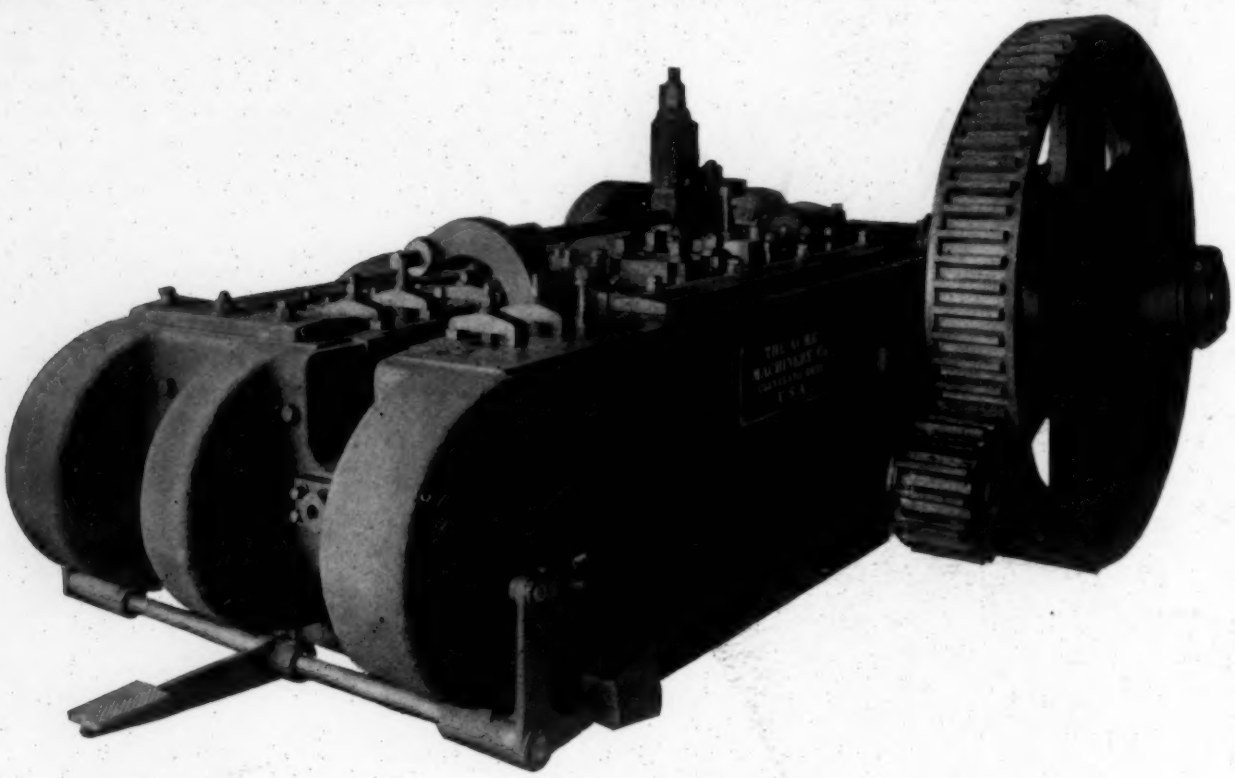


FIG. 1.—A NEW UPSETTING AND FORGING MACHINE.

A MACHINISTS' STRIKE WITH TYPICAL MISTAKES.

The Keystone Driller Co., of Beaver Falls, Pa., has been involved recently with some of its machinists in a strike. Feeling in the community has been aroused, the boycott has been resorted to, and there have been other features of the contest which stamp the course of the union as ill-advised and short-sighted. While deprecating newspaper controversy, the company, through one of its officers, Mr. R. M. Downie, sent a communication to a local paper. This we reprint nearly in full because it presents the Beaver Falls trouble as typical of many strikes that begin with arbitrary action, that refuse conciliation and rely on main strength and intimidation to carry them through. Prefacing his communication with the statements that it is not to be followed by any further public discussion of the matter on his part, and that he speaks only for his own company and not for other manufacturers, Mr. Downie says:

"So long as the strike affected only ourselves it was a matter of indifference what the public thought of it; but when it takes a form that involves the peace and welfare of the whole community, we feel that it would be unjust to the public to allow it to be imposed upon. Tradesmen have been warned by the union not to sell goods to the workmen who are in the employ of the driller company. Barbers have been threatened if they shave them. Grocers have been threatened with boycott if they sell provisions to the boarding houses where employes stay. Bakers have been importuned to refuse to supply bread. Workmen of other trades have been threatened if they would do work for the company, etc., etc. Now we submit that this boycotting and annoyance of innocent storekeepers and tradesmen is barbarously unjust. It is thoroughly unmanly, un-Christian and un-American. The union thus attempts to compel business men to stand in with and fight its battle—or go into the sheriff's hands. Such tradesmen have a right to demand of the union that it put up a bond to make good the loss of trade and confidence occasioned to them by compliance with their 'demands.'

"To conspire behind locked doors and under oath-bound secrecy to terrorize innocent parties who cannot be forced to help the union to hold up the manufacturers, is the same in nature, kind and effect as highway robbery. Is it true that

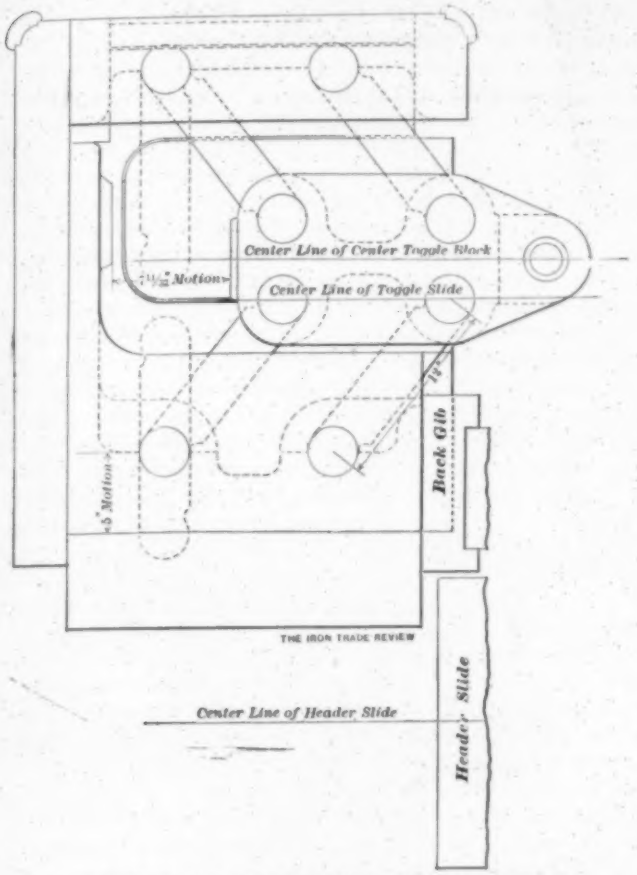


FIG. 2.—LINKS AND TOGGLE BLOCK OF NEW UPSETTING AND FORGING MACHINE.

the system of licensed brigandage which prevailed in Europe for so many centuries is to be allowed to prevail in free America? The threat of a boycott ought to be made a penitentiary offense for it is far worse than a burglar's jimmy or a footpad's pistol. The community is not for an hour safe while any association organized to use it for terrorism exists. As a matter of fact these threats amount to little or nothing beyond a scare—for people buy where they get honest goods for a fair price, and if tradesmen would snap their fingers in the face of such threats they would thenceforth cease to be made, and the community ought to take care of the man who has the sand to do it.

"The alleged strike at the driller works was to enforce a demand for ten hours pay for nine hours work. The simple statement of it should condemn the whole cause. It is precisely the same thing as demanding ten pounds of sugar for the price of nine—or demanding of a banker $100 on a deposit of $90. The strike was organized by the machinists' union and at first affected only the machinists in our employ. The committee of striking machinists met with the writer and represented as an argument for the allowance of the demand 'that the company would not have to give it to the other employes of the company.' This committee argued at length that the workmen in the other four departments of the factory were not organized and therefore were not to participate in the advantages of the 'demand,' and that the company could thus better afford to grant the demand of the machinists. In effect, this was an attempted conspiracy against the other employes—men who received less average wages than the machinists were already getting. The company was asked to become a party to this selfish conspiracy—and of course refused. If any should have been granted the nine-hour day, it should have been the common laborers, smiths and boiler makers whose tasks are several times more laborious than sitting before a lathe watching it do the work. The argument reduced to a sentence, was this: 'Grant the machinists' demand and keep the other employes at work to pay for it.' This selfishness, which is the spirit of the whole trouble, enlisted our opposition at once, and the demand would have been refused on this sole ground if there had been no other. We will not knowingly become a party to such injustice.

"Pending the company's reply to the machinists, three other departments in the factory learned of the trick, and to get even, struck, and the company, while it regrets the loss to them in wages does not blame them. After a couple of weeks, all the workmen in these other departments that could be given employment were taken back without prejudice, and these are now running full handed. These workmen, not being controlled by a union, could treat with us and we could reason with them, and seeing their mistake we soon reached an agreement satisfactory to all concerned. If they had been controlled by a union no doubt they would have been out yet—to the loss of all.

"In formally refusing the demands of the machinists, we did not deny it on the ground that they belonged to the union. Up

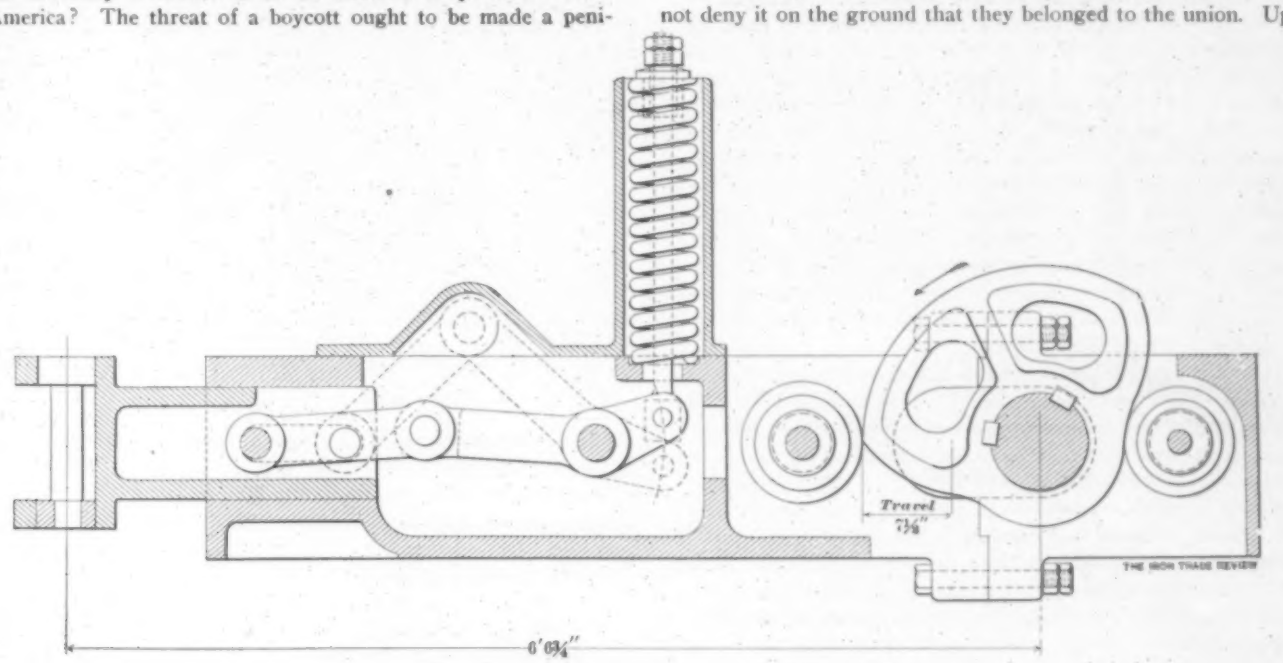


FIG. 3.—TOGGLE SLIDE AND AUTOMATIC RELEASE.

to that time the company, so far as I know, never asked an applying workman whether he was a union man or not, but our experience has now fully convinced us that it is a very proper and necessary question. A company cannot afford to harbor within its works that which may hold it up with an organized boycott at any moment.

"The reason why the demand was not, and will not be granted, was reduced to writing and handed to the men. They were told that the reasons were fixed and final—and totally

beyond the company's control. The company could not grant it and continue to pay expenses. To prove this, and in the full belief that the proposed strike could be avoided by frankness and face to face candor, a summary of sales and expenses for five months, immediately preceding the strike, was taken from the books of the company and shown to the committee. They were invited, if they had any doubt about the correctness of the summary, to freely interview the bookkeeper or treasurer and appoint a committee to examine the books and vouchers by items. They were shown that the demand, if granted, would so reduce the product, and at the same time so increase the cost of the product, that it would be impossible to continue in business. It was shown that our competitors were running ten hours a day, while we were running but nine and one-half, and that they, our competitors, already were paying about 20 percent less for ten hours than we for nine and one-half, and therefore, to grant the demand meant to shut up the factory. We further, verbally, offered to submit the whole matter to five arbitrators, allowing the strikers to choose three of them. To all of this a deaf ear was turned because the union was in control.

"The whole contention and argument of the strikers was that machinists elsewhere had been granted a nine hour day at ten hours' pay. This may be true, in spots, or in factories which make a profit of 20 or 30 percent on their product and can afford it. It has not been universally granted—nor even generally. It has been granted in some shops in the valley, where two, three or four machinists only were needed, to save trouble and prevent throwing the hundred of other workmen out of employment.

"We, however, have totally eliminated the questions of how many hours shall constitute a day's work by a fair and equitable piece-work system, and those who do not wish to work by the piece are paid by the hour. The engines run ten hours per day to accommodate all. And since we do no 'Sunday work,' do not run 'overtime' nor require any one to work on holidays, we have eliminated every point for which the strike was instituted. So far as we are concerned, the strike was ended some time ago—and the fact is no workmen having any claim on us for position or wages, or anything else except good will, is among those who are carrying on the strike. All our men are at work.

"The writer, within a day or two, had a chat with a gentleman said to be the president of the union—in any case, he was engaged at the time in running men out of town who had come here seeking employment,—and said that he was receiving $18 per week for doing it. The writer informed him of the above unanswerable reasons, reminded him that the company had done something for the town; that it cost the company $1.10 per minute to run, all of which money, as far as possible, being paid out at home; that to stop the factory stopped the coming of this money to Beaver Falls; that the action of the union meant to either shut up the factory or drive it to some other location where it could survive. To this his reply was that 'it would be a good thing if it was driven away from Beaver Falls.'

"Thus it is that arbitration, reason and common interest have all failed. There was nothing left for the company to do but to bring machinists from a distance, and this it is doing. If, by means of brute force, or enforced sympathy, the company is defeated, the workmen of the other four departments will eventually be thrown out of employment—for all departments must operate to make our product.

"Once for all, the company will not submit to the reckless and unreasonable spirit of this organization, simply because it means financial suicide. And now, if the community desires a company that has always paid more than the highest wages elsewhere going for the kind of work done; that has not missed a payroll in twenty years, or a fair annual dividend to its stockholders in all that time; a company whose goods go to all parts of the globe and bring back the cash; a company with a quarter of a million local capital profitably invested (much of it the savings of widows, orphans and retired ministers), a company that has always employed the best class of home labor. We say if the community desires such a company to shut up or move out all it has to do is to sympathize with the union, whose spokesman declares that such moving out would be a good thing.

"The driller works are capable of indefinite expansion and this is the policy of the company. Within a week prior to the ordering of this strike some new machinery had been ordered and the company was just on the point of ordering still more. All this was stopped, of course, and will so remain until we find out whether or not the company will be allowed in peace to employ men and operate it. From this moment forward we have no use for the attempted control or dictation of an irresponsible and unreasonable association, nor any workman who is in a position to invoke its rule-or-ruin power to prevent us from doing business in the town, or who is actuated by a desire to drive us out of it. The matter is now up to and respectfully and fairly submitted to the public.

"Allow us in conclusion to say that we believe strikes, at the dictation of secret oath-bound organizations, while they may be recognized as legal, are morally wrong in principle, vicious in operation and always disastrous in final result. Reason and fairness don't need obscurity, and they can not and will not grow in the dark. There is no single item connected with the dispute between labor and capital that can not be discussed in the open light of day. The spirit that would ruin another in order to rise, never invented, promoted or did anything to make anybody better or happier, except by accident. It is not in the nature of things that good can grow from bad. There is an eternal principle as sure to operate as as the law of gravitation that prevents it, and the bad not only comes home to those that institute it, but as well to the innocent beside them. They proceed on the notion that 'the goose that daily lays the golden egg,' may be killed with profit. The sixteenth annual report of the Bureau of Labor just issued by the government shows from twenty years' statistics gathered from all States, that for every dollar of loss caused to employers by organized strikes double that amount in addition falls on employes. In this way employers lost in twenty years about $125,000,000, while employes lost $265,000,000. Surely it would be better to save all this loss and suffering by arbitration and the employment of wisdom and good will instead of war and waste.

"In the last event if employers should be unreasonable, and if the workmen can not otherwise get a fair proportion of the profits, let the latter form co-operative companies such as was proposed in a local paper a day or two ago. By all means let us have another driller works and let Beaver Falls be headquarters for the world for that kind of machinery. The money uselessly wasted in this strike would have made a good start. Workmen could then put wages up to suit all, work nine, eight, seven, six or five hours a day and at the end of the year get all the profits in addition."

The Marinette Iron Works Mfg. Co., Marinette, Wis., will in all probability refuse to remove its plant to Warren, Pa., owing to the inability to secure structural material for the erection of the plant. The demand for Walrath gas engines, which the company manufactures has been very large and it is probable that an addition will shortly be erected to the present plant. In that case the plant will not leave Marinette.

The purchasers of the Jefferson Furnace and iron lands at Jefferson, Tex., will shortly blow in that furnace. The following are the board of directors: L. S. Colyar, R. W. Healy, George D. Lancaster, D. B. Meacham, W. B. Ward, T. J. Rodgers and W. T. Atkins. L. S. Colyar has been elected president and general manager.

The Toledo plant of the Shelby Steel Tube Co., located at Toledo, O., which has been closed for some time is now being dismantled and the machinery is being removed to the company's plant located at Shelby, O.

The affairs of the Hudson Iron Co., of Hudson, New York, were wound up last week by the supreme court of that State and after the payment of all the debts there was distributed among stockholders $38,332.57. The capital stock was $375,375. The company has not been doing business for a number of years.

THE "CHICAGO" DRY GRINDER.

Hill, Clarke & Co., of Chicago, have recently brought out a line of dry grinders which possess some points of special merit. One of the most important features of the "Chicago" grinder is that the column and head are cast all in one piece, thus giving great rigidity and compactness to the machine, as well as a pleasing outline. The boxes are connected by a web as far up as the center line of the bearing; and this too stiffens the construction. The accompanying cut, Fig. 1, gives a very good idea of the 16-inch machine.

The bearings are designed to oil continuously, and will not admit dirt or emery grit, as may be seen from the engraving, Fig. 2. The small groove cut in the spindle at either side of the actual bearing surface, but yet inside the cap, effectually stops the advance of dirt along its length, as well as retaining the oil in its proper place. No oil can creep along the spindle to be sprinkled on the operator. There are no oil holes in the cap, where dirt might easily lodge, but the oil cup is placed below the spindle, opening directly into the oil receptacle, which is cored out of the column. The wick, rising from this abundant supply of oil, is in actual contact with the shaft for several inches and provides constant and ample lubrication. No grit can mount the wick, so that even should some be introduced with the oil in the infrequent act of refilling, or in any other way, it would be harmless. The bearings will run from three to six months without attention. A pan with water pot is securely bolted to the column, but is readily removable. Two rests for work are provided and these are unusually strong.

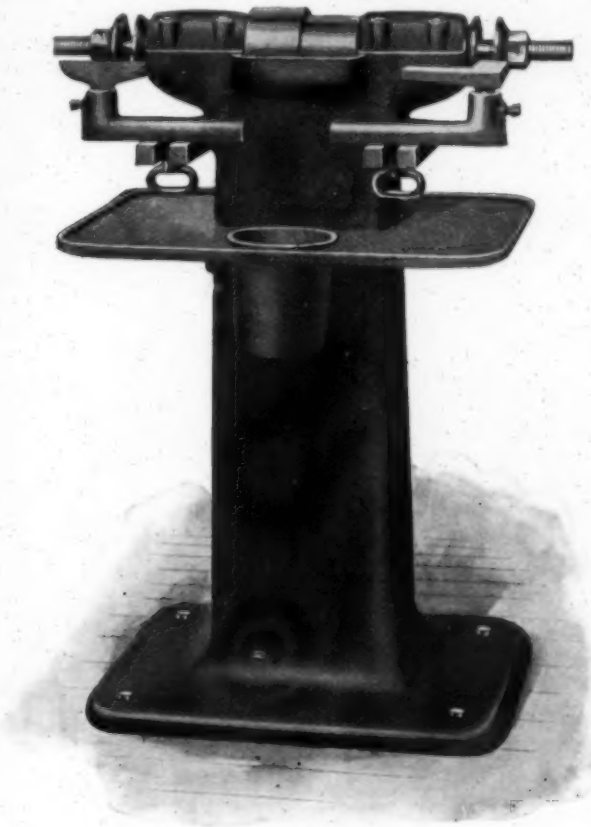


FIG. 1.—"CHICAGO" DRY GRINDER.

These grinders are now made in 12-, 16- and 20-inch sizes.

Charles Davidson, president of the Union Drawn Steel Co., Beaver Falls, Pa., has sold 744 shares of the stock he held in that company to F. N. Beegle and Mrs. J. J. Davidson of that place. The stock was sold at $402.23 per share about three-fourths of the stock of the company having changed hands.

The molders employed by the Crescent Iron Works, Springfield, Mass., have gone on a strike for an advance in wages. They demand an advance of 1 cent an hour for machine molders, brake shoe men 2 cents a flask, molders' helpers from 1 to 1½ cents an hour.

The Columbus Watch Co. will move to South Bend, Ind., and its name will be changed to South Bend Watch Co.

LAKE SUPERIOR IRON MINES.

The Austin F. Mining Co Co., of Iron Mountain, Mich., of which John F. Friedrichs is the president, has made arrangements to make thorough explorations of property on which it has options. The capital will be furnished by a large Eastern furnace company upon recommendation of W. J. Rattle, of Cleveland, who recently visited the property. The first shaft will be sunk on Section 33 at once. The company was organized about a year ago and has under option the north half of the northwest quarter and the west half of the southeast quarter of Section 33. Mr. Friedrichs has done considerable work on the property during the past two years with satisfactory results, but was handicapped by a lack of money. Now all the capital needed is promised.

More than 175 steam drills are now at work along the Mesabi range. Most of these are west of Hibbing, where it is thought that the greatest new tonnage is likely to be found.

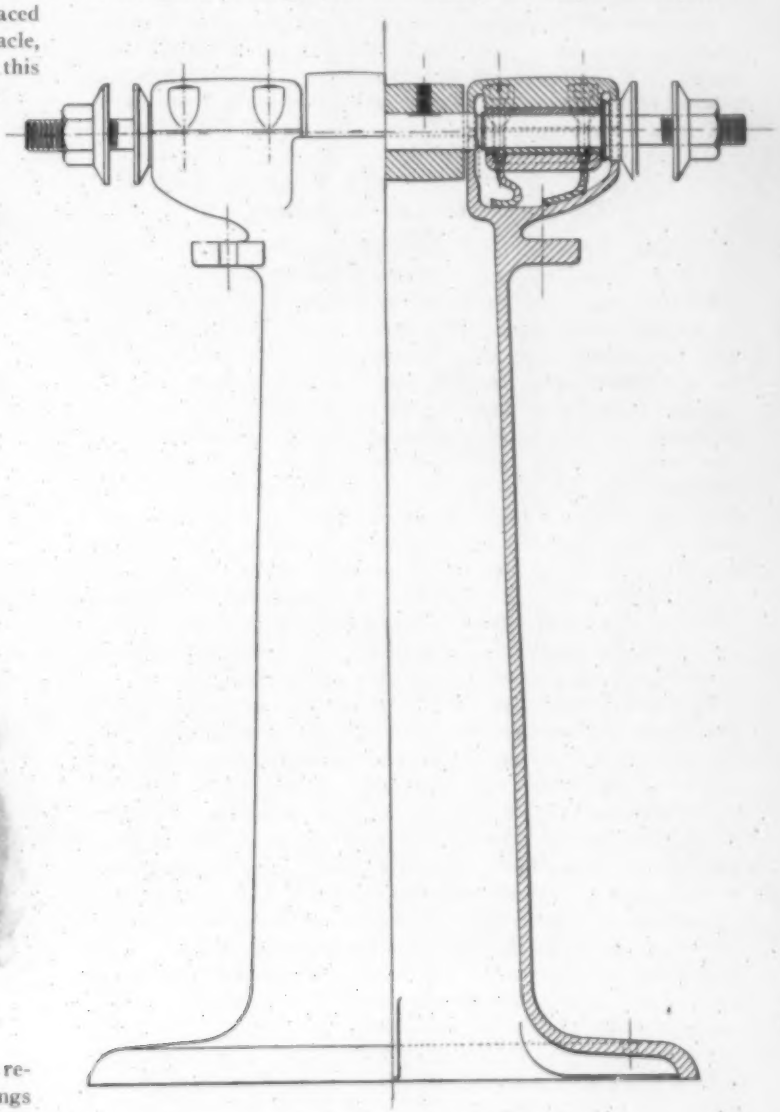


FIG. 2.—"CHICAGO" DRY GRINDER.

More than 1,000 men are employed about these drills, and the monthly pay roll of the drill explorers and syndicates amounts to at least $70,000.

There is practically no opposition to the sale of the Republic mine on the Marquette range on the terms mentioned in this column last week and it is expected that in a few days the official announcement of the sale will be made.

Capt. Thos. J. McCusker has concluded a deal with the Newport Mining Co. for the sale of his exploration on Section 6 in Iron County, Mich. The prospect of turning out good ore is said to be excellent.

The work of sinking the new No. 5 shaft at the Aragon mine, which was commenced in April, 1901, was completed a few days ago. The bottomed timbers of the shaft are 1,081 feet from the surface and the bottom level is 1,060 feet. General Superintendent Davidson says the company will centralize the business of the mine around No. 5 shaft. This means

the removal from present locations of the office, laboratory, machine shop, carpenter shop, blacksmith shop, warehouse, dryhouse and sawmill, in addition to the erection of a large pumping station and boilerhouse.

One of the largest steel shafts in the Superior region will be sunk at the Chapin mine. The inside measurements will be 10 feet 4 inches by 23 feet 1 inch. The compartments will be four in number, viz: Two hoisting compartments, 5 by 8 feet in size; one cageway, 5 feet by 10 feet 4 inches, and one pump compartment 10 feet 4 inches by 11 feet 1 inch. In this last compartment will be erected a mammoth Cornish pump. The shaft will be sunk to a depth of 965 feet before crosscutting is done. At this depth connection will be made with the twelfth level of the Hamilton shaft.

The Tyler Mining Co. is the name of a corporation formed to explore the Parks-Erikson property adjoining the Bird mine on the South. The Thomas Furnace Co., of Milwaukee, is reported to be interested. Exploring is progressing in earnest.

More ore will be shipped from the Crystal Falls district this year than ever before, and the Crystal Falls mine will be the leader. The Armenia and Tobin, new mines, will ship stockpiles of about 40,000 tons. Other new mines are at work, and old mines are reopening and replacing old machinery with new.

The Outlook for Lake Shipbuilding.

President Brown, of the American Shipbuilding Co., has said in an interview that the various yards of the company are completely filled with work for the season up to the opening of navigation in 1903. "We could find room to lay the keel for several more ships among the various lake yards," he said, "but it would be impossible to assemble the necessary material for building them in time for delivery at the opening of navigation next year. There is a great scarcity of steel and iron for delivery this side of the first quarter of 1903, and this fact may stay the progress of several projects in shipbuilding for a year. Already we are figuring on business for 1904 delivery, but thus far none of these contracts have been placed. Detroit interests are negotiating for two large passenger steamers to run to lower ports, and these will very likely be among the first orders placed for completion the year following next. There are many more orders for freighters to come for delivery during the same period."

President Brown says there is no occasion for fearing that the industry will slacken its recent rapid pace, unless the prosperity of the country goes to pieces. On this he said: "There can be no overplus of new tonnage for a number of years to come, even at the rapid rate the yards are turning out modern ships. For instance, the iron ore trade alone will occupy the constant services of fully 300 modern boats at the rate material is now moving. The modern ship is what is wanted, and they will continue to build them for some time before all requirements are filled; in the meantime tonnage they displace will seek other branches of the lake trade. Wrecks and abandonment, because they will become obsolete, will do away with many of them."

In a newspaper report of an interview at Minneapolis with John N. Beyers, superintendent of the British-American Construction Co., Ltd., of Cape Town and Johannesberg, South Africa, he is quoted as follows: "There is a good deal of truth in statements concerning American manufacturing supremacy especially when it comes to bridge steel and that sort of heavy construction material, as well as all sorts of machinery. In round figures I have purchased in this country within two weeks nearly $2,400,000 worth of heavy iron and steel work. Most of it is for bridges that must be put in at once. These structures were either destroyed by the Boers or British in warfare. Many of them were wooden affairs under the old system, but the new ones will be of a permanent character. The reason for placing orders in the United States is that manufacturers in Great Britain in this line are pretty well loaded down, but where their enterprise fails, it seems to me, is in not having extended their capacity so that when the rush came they could take care of orders. Of course, a tremendous amount of trade that should go to the British manufacturer will come to this side during the period of regeneration."

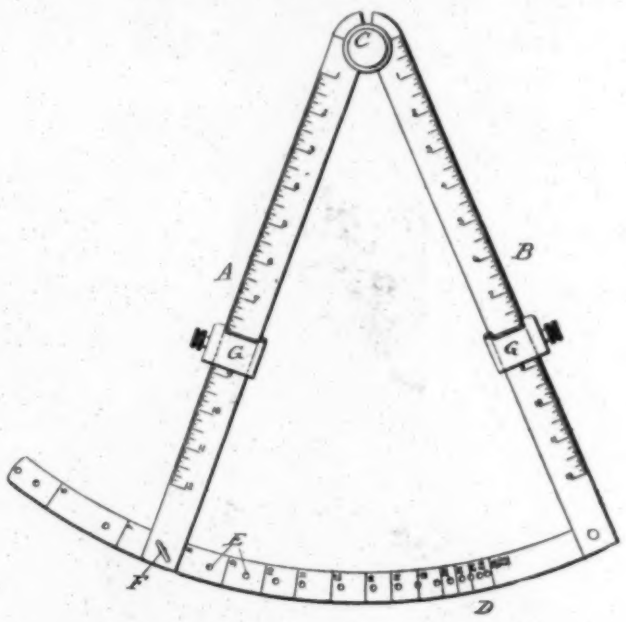
A NEW SCALE FOR CHORDS.

A measuring instrument has been invented by Gustave J. Luck, of Milwaukee, Wis. Mr. Luck is in charge of the toolmaking department of the Allis-Chalmers Co. in that city and found a need for some sort of a scale by which chords for any angle or any radius could be readily determined; for example, a circle of a given radius may be evenly divided up or spaced off as desired. Such an instrument would be especially applicable to locating bolt holes in cylinder heads, etc.

Referring to the drawing, A and B indicate two arms connected to each other at the pivot C. A sector arm or plate D is attached to the outer end of the arm B. The sector plate D is provided with a series of graduations or numbers—as for instance from "6" to "32"—and holes E are cut in the plate so that when the movable arm A is swung around over the sector it may be secured in proper position with relation to any of the graduations by a pin F.

Each of the radius bars A and B has a sliding block G provided with a thumb screw and the blocks have a centerpunch mark or seat in line with the inner edge of the bar. The radius bars may be graduated as shown to determine the distance of the blocks from the pivot joint, or in other words the length of the radius of the circle. If preferred, however, the distance of the blocks from the pivotal point of the radius bars may be laid off by the use of a single or double-shrink rule.

In use the blocks are set at any desired distance along the



A MEASURING INSTRUMENT FOR CHORDS.

radius bars from the pivot and held in that position by the thumb screws. The arm A is then swung over the sector bar until it is brought to the notation corresponding to the number of spaces into which it is desired to divide the circle and is then fastened. The distance between the centerpunch marks will be the chords which will divide the circle up into the required number of spaces. The centerpunch marks facilitate the use of dividers in taking and transferring the measurement. The instrument can be made in various ways and the sector D may be straight and pivoted in such a manner that the whole device may be folded for greater convenience.

A. J. Yungbluth, secretary, announces that the eighth annual meeting of the Lake Superior Mining Institute will be held on the Minnesota ranges, beginning Tuesday, Aug. 19, and continuing three or four days. The excursions planned by the local committee will furnish an opportunity to visit all points of interest. Some interesting papers will also be presented.

O. C. Davidson, general superintendent of the Oliver Iron Mining Co. for the Menominee range, has had his duties greatly enlarged. Heretofore the company's mines in Iron County have reported to the general office at Duluth. In the future the reports will be made to Mr. Davidson.

The Kindl Machine for Unloading Ore and Coal.

Frederick H. Kindl, of Pittsburg, has been allowed patents on an improved apparatus for unloading coal and ore from vessels, which is designed to prevent the damaging of vessels and the unloading device, while the unloading operation is in progress, and in which the dead moving load itself is very light in comparison to the actual material carried. The engravings show the improved apparatus in detail.

From the description of the device it will be seen that after the digging arm is once in the hold of the vessel, the only dead load required to be moved is the bucket carrying the ore. This bucket will not weigh over 2 tons, while the amount of ore that it carries when full is estimated at 5 tons. The digging arm being on an angle has a working radius of 16 feet, or in other words, but little movement of the machinery will be required excepting the rotary motion of the digger arm to clean out the hatch of the vessel completely. The estimated tonnage that can be lifted from the hold of a boat is 4,000 tons in 10 hours. The cost of the machine complete will not exceed $50,000, and it is estimated that the labor charge for unloading 1 ton of ore will not exceed 1 cent from the vessel to the car or stockpile. The machine is so designed that it can be operated in conjunction with the present bridge equipment of the docks.

The Carnegie Steel Co. has already obtained the right to use this machine at its docks, Conneaut, O., as well as at their coaling stations in the Pittsburg district for unloading coal from barges. It is probable that several of these machines will be built in the near future for use both at Conneaut, O., and for unloading coal barges. The machine is mounted on a framework which is movable along the dock and all parts of the hold can be reached by the discharging apparatus with no danger to either the latter or the vessel during the process of unloading.

Fig. 1 is a side elevation of the machine and Fig. 2 is an elevation showing the upper portion of the tilting frame, trolley and hopper in greater detail. Fig. 3 is a vertical section through the bottom of the elevator with the bucket in place. Fig. 4 is a side elevation of the driving mechanism. The traveling framework A is mounted on trucks running on tracks along the dock B. These tracks are placed some distance apart and between them are the cars into which the ore is to be discharged. The framework A which supports the entire apparatus is propelled by means of an electric motor connected by suitable gearing, as shown in Fig. 1, and by means of the reversing controller the machine may be moved in either direction along the tracks to bring it to any desired point for operating upon the material. On the central portion of the framework and extending lengthwise are two rails carried on hangers between which is mounted a hopper supported by wheels resting upon these tracks. The hopper is moved along the tracks by an electric motor geared to one of the axles. Above these hopper tracks is pivoted a swinging bridge D mounted on trunnions. The bridge is formed of girders spaced and secured together by bracing and having track members secured to the upper portion, the tracks being provided with stops at each end. A trolley E moves on these tracks and is provided with bracket arms having shoes which engage with the under side of the bridge and preserve the stability of the trolley as the bridge and leg are tiltd. This framework has side bearings with trunnions and a turntable and on the underside of the latter is an internal gear with pinions attached to shafts extending upwards to the mech-

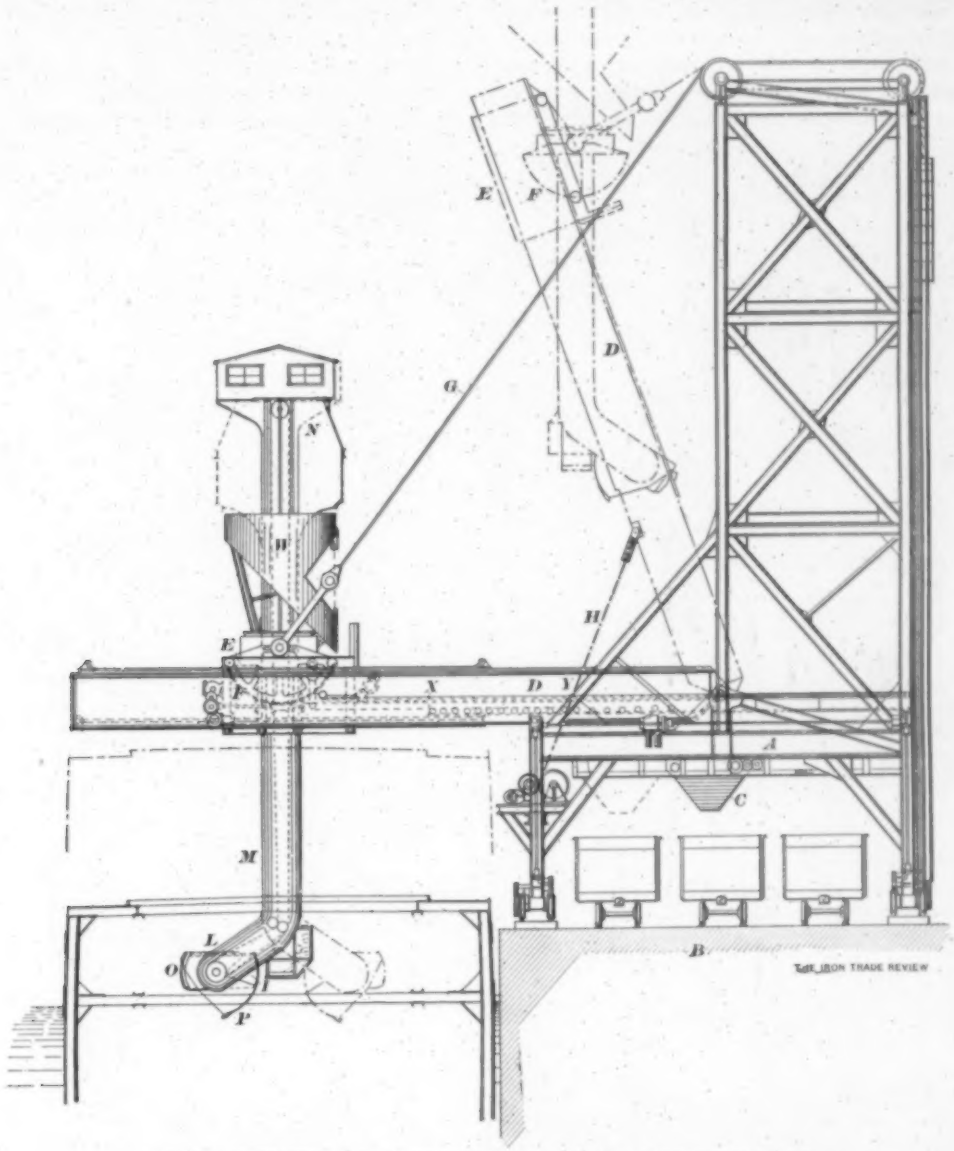


FIG. 1.—ELEVATION OF KINDL ORE UNLOADER IN WORKING POSITION.

anism at the top of the elevator and by this means a rotary motion can be imparted.

Two semi-circular racks F project downward from the supporting frame of the turntable and these mesh with Hindley worms, the teeth on one side of the machine being right-handed and the teeth on the other side being left-handed. The worm shafts are connected with bevel gears to a horizontal shaft driven through a friction clutch. A spring normally holds the friction clutch in an open position and a lever is moved, to close the clutch against the action of the spring, by means of a cord extending down to the operator's cage near the lower end of the elevator. This cage is seen within the hatchway of the vessel shown in Fig. 1.

Wire cables G carry the load comprising the bridge, trolley and elevator. These cables are connected to links attached to the outer ends of the trunnions and of the frame supporting the turntable, and from thence the cables extend over two pairs of sheaves at the top corners of the vertical framework A. Each of the tables consist of four wire ropes and each rope has its indicated groove in the sheave. The cables pass

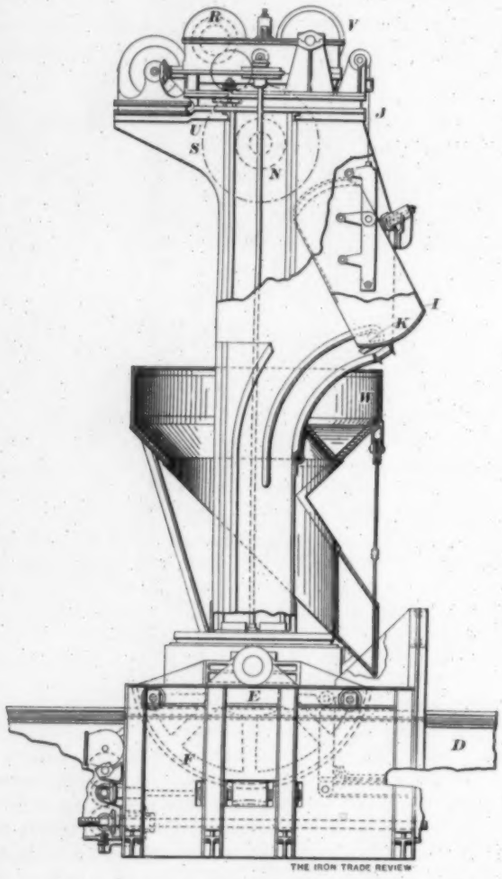


FIG. 2.—SHOWING UPPER PART OF TILTING FRAME, TROLLEY AND HOPPER.

down at the back of the framework and are secured at their lower ends to a counterweight; above this main counterweight are placed similar weights having at their ends successively deeper recesses from the top downwards. When the bridge is in a horizontal position the entire system of counterweights becomes effective but as the bridge swings upwards from the horizontal to the position indicated by the dotted lines in Fig. 1 these counterweights will be successively caught upon and supported by a series of brackets. The ends of the counterweights are directed by guides to prevent their swaying during the swinging of the bridge. The weight of the combined counterweights is more than sufficient to counterbalance the bridge and its load and the machine is drawn downward to a working position by cables H extending from the side members of the bridge to winding drums driven by an electric motor mounted on the frame. The cables H extend upward through stirrups on the bridge and are secured to caps which rest upon nested spiral springs. The downward pull of the cables is thus exerted upon a yielding resistance and when the bucket is digging the material from the vessel the motion of the latter exerting a lift on the elevator or leg will swing the bridge upward and compress the springs, the yielding connection thus preventing injury to the bottom of the boat or the machinery which would otherwise result from a rigid construction.

The elevator is made in hollow form and secured to the turntable through which it extends. The extreme lower portion of the elevator projects at an angle, as shown in Figs. 1 and 3, and guides are provided which extend from end to end of the interior. The bucket I is equipped with trunnions attached to the hangers and pivoted links having a cross bar to which is secured the lifting cable J. The bucket moves within the hollow elevator and is provided with rollers to act as guides in the up and down movement; the rollers K engaging guides at the hopper portion of the elevator and there tilt the bucket into the position shown in Fig. 2 and thus dump the material into the hopper W.

The bucket enters a holder L, Figs. 1 and 3, at the lower end of its travel and the trunnions rest in Vs in the sides, the bottom of the bucket resting against fixed supports. The bucket holder consists of a hollow case open at both ends, with side trunnions projecting through stationary bearings at

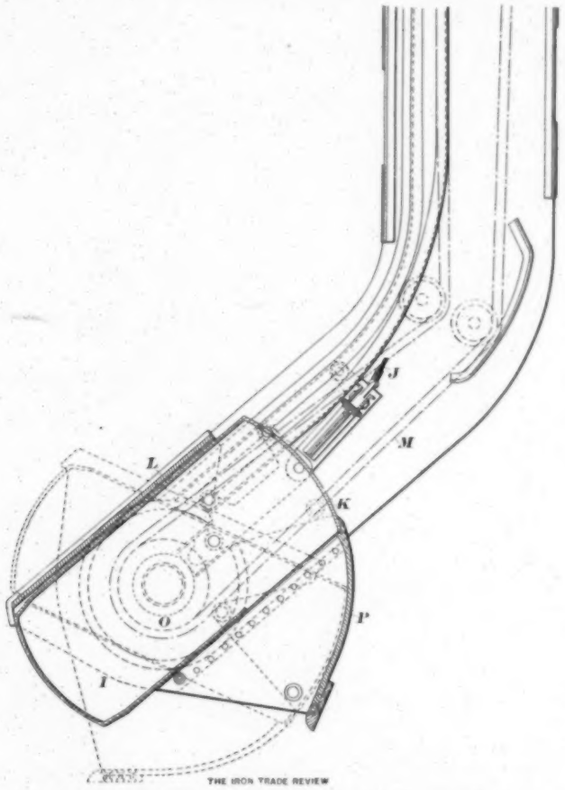


FIG. 3.—VERTICAL SECTION THROUGH BOTTOM OF ELEVATOR, WITH BUCKET IN POSITION.

the bottom of the elevator; the trunnions having sprocket wheels O around which pass chains M. The chains M at the bend of the elevator pass over guide wheels and at the upper end of the leg travel over sprocket wheels N operated by driving mechanism. The bucket holder and the bucket are rotated by these chains and sprockets to scrape up a load of ore and to assist in this action the end of the holder is curved as shown at P and provided with a movable knife.

An electric motor at the top of the elevator turns the bucket holder, rotates the turntable, lifts the load and after emptying the bucket returns it to the position within the hatchway. The elevator being rotated by means of gearing which is thrown into action by a clutch; springs holding the clutch in an open position until closed by a pull on a cord leading down to the cage of the operator.

A loose worm Q, Fig. 4, is employed to drive the mechanism rotating the bucket holder. The worm Q meshing with a gear R which by a train of gears drives the sprocket wheels.

The hub of the wheel S is enlarged and provided with a cam groove having an offset at T. A roller fits this groove and operates an arm having a forked connection with a clutch operating the loose worm Q. The lever is drawn down against the action of the spring by a cord U leading to the operator's cage.

In order to raise and dump the bucket and return it to the hatchway a loosely mounted winding drum V is driven by worm gearing. This winding drum is made with a disc and band brake; the one end of the brake band having a lever connection which is normally drawn down by a spring. A cord is used to release a latch loosening the band and throwing the brake out of action. A tappet or clamp is fastened to the hoisting cable in such a position that as the bucket reaches the upper end of its travel the tappet will strike an arm and detach the drum clutch and at the same time apply the band brake by the mechanism already described. The bucket now being dumped, the friction on the disc member will hold the bucket until the brake action is partially relieved by the operator when its weight will cause it to descend, the speed being regulated by the help of a counterbalance and the operator can thus regulate or stop the movement of the bucket by this cord leading from the counterweighted lever over a suitable pulley and thence to the cage. The controller for the electric motor at the top of the elevator is located in the operator's cage so that he has under full control the movements of the elevator, bucket and the bucket holder as well as the motion of the trolley.

The hopper is of annular form and provided with an inclined bottom and in order to prevent the ore from dropping freely the entire depth of the hopper on its lowest side an inclined part is attached which projects inwardly and is attached at the inner end to the cover of the lower portion of the hopper.

An ore car is provided at the outlet door of the hopper, this car having wheels with a central flange and treads on each side arranged to run on two sets of tracks. The rails of the outer track extend from the pivotal point of the bridge inwardly to the point marked X, Fig. 1, whilst the rails of the inner track located between the outer rails are pivoted at their outer ends to links attached to the trolley, the inner portion of the rails resting upon a set of transverse rollers. When the machine is in the position shown in Fig. 1 the inner rails extend to the point marked Y and as the trolley is moved back and forth on the bridge the inner rails move over the supporting rollers and constitute movable extensions of the main track. A small electric motor is mounted on the ore car for moving it to and fro on the two sets of track and after it has received its load from the hopper it is moved back on the inner rails until the outer treads strike the outer rails after which it is sent to a position over the movable hopper over the cars on the dock. The ore is then dumped into the hopper and thence to the cars on the track beneath. The rails of the movable track are secured by stringers which are rigidly braced together.

The patent describes and illustrates modified forms of the bucket holder in which a swinging casting will accommodate its position to the bottom of the hold and the movements of the boat. This construction would provide a substitute for the yielding springs for the retaining cables.

In the operation of the device the electric motor propels the machine along the dock to the requisite position alongside the vessel, the bridge and elevator being in the position shown in dotted lines in Fig. 1. The hauling cables H are then wound on their drum and the bridge swings down into a horizontal position, the elevator leg entering the hatch of the vessel, the parts of the machine assuming the position seen in the full lines in Fig. 1; the trolley moving along the bridge to bring the elevator to the proper place. The operator from his station in the cage at the lower part of the elevator brings the leg into position by starting the motor for driving the turntable or swinging the tilting frame, or both, and moving the trolley on the track. He then starts the rotation of the bucket holder by pulling upon the clutch cord and releases the cord as the holder moves. The bucket holder makes one rotation and as it returns to its original position, with the load scooped into the bucket, the automatic release stops it at this point. The operator then pulls the cord for the drum clutch and the hoisting mechanism draws the bucket upwards; as it nears the end of its travel the top trunnions engage with guides and the bucket is tilted until it strikes the spring buffers. When the bucket attains an inverted position the tappet on the hoisting cable strikes the stop lever, throwing off the hoisting drum clutch and applying the band brake. The operator releases the brake and the bucket falls down the elevator and into the holder under control of the brake.

When the desired amount has been taken from one hatch, the cables H are unwound a sufficient distance to allow the lower part of the elevator and the bucket holder to rise above the deck of the vessel, the counterweights acting to swing the bridge upward when the cables are released. The machine is then moved to the next hatchway, the bridge again hauled into position and the unloading continued.

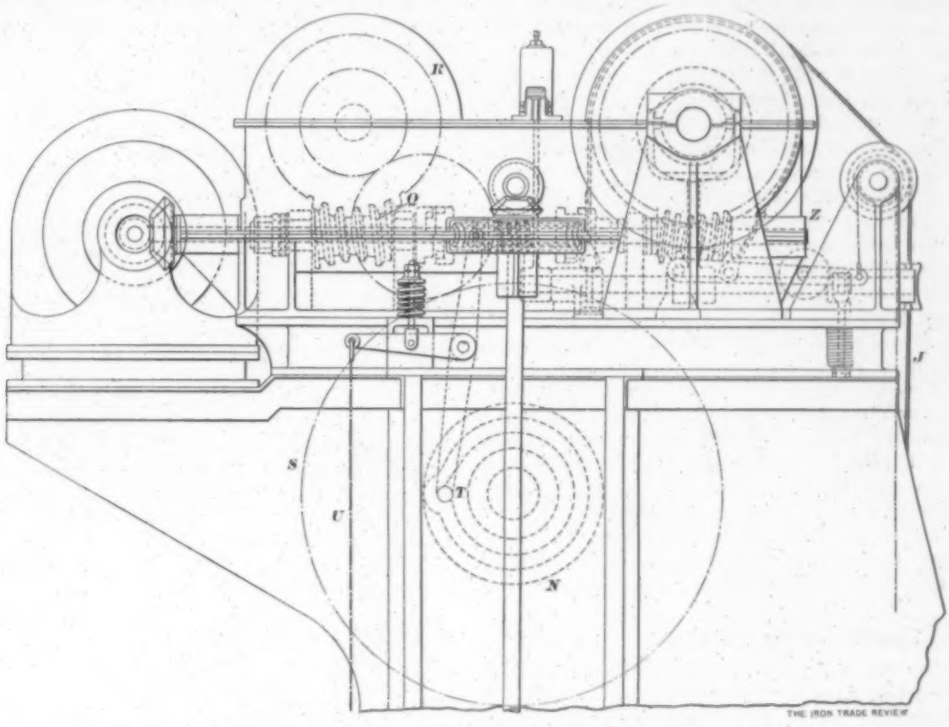


FIG. 4.—SIDE ELEVATION OF THE DRIVING MECHANISM.

REPUBLIC IRON & STEEL CO.'S STATEMENT.

To the Stockholders of the Republic Iron & Steel Co.:

Your executive committee herewith begs to submit to you its report and statement covering the business of the company for the six months ending June 30, 1902.

New Construction.

The most important events in the history of the company during the last six months have been the completion of the new large blast furnace and other improvements in Birmingham, and of the new billet mill at Youngstown. The new blast furnace, designated as Pioneer No. 3, has a daily capacity of 300 tons. It is furnished with all modern equipments and every approved labor-saving device. It was blown in on the 13th day of June, 1902, and has since been successfully operated. We do not hesitate in saying that its efficiency and appointments are superior to those of any other furnace in the South. We have also installed two new blowing engines at our Pioneer Furnaces, Nos. 1 and 2, thereby greatly increasing the capacity of these furnaces. We have enlarged our coking plant at Birmingham so as to have a battery of 910 ovens.

During the six months, we have completed the opening of the Pratt seam of coal in the Birmingham District, and are now mining 2,000 tons of coal per day from this seam as well as 1,200 tons per day from the Newcastle seam. The coal from both seams is washed and sent to our ovens at the furnaces, producing coke of superior quality and in sufficient quantity for all our requirements.

The billet mill is operated in connection with our steel plant at Youngstown, and is recognized to be the most efficient mill now in operation in the country. It was successfully started during the month of April, 1902.

The company is now commencing to derive the benefits of these important additions to its plants and during the next twelve months it will be further strengthened by the enlargement of its Bessemer plant from the present daily capacity of 1,000 tons to a daily average capacity of 1,500 tons, by the construction at our Youngstown works of three new continuous mills of the standard Morgan Construction Co.'s type, and of another such mill at the company's Moline plant, to supply the large local demand at that place. The contracts for this additional new construction work on our books on the 30th day of June, 1902, amount to $574,612.04. The total sums expended for entirely new construction, since the organization of the company in 1899 up to the date of this report, amount to $4,385,562.65.

Condition of the Old Plants.

The old plants of the company, which are geographically well located and best fitted for economical production, have, ever since the organization of the company, been maintained in the best physical condition. In this way the sum of $2,470,881.45 has been expended for reconstruction, improvements and repairs, which has all been charged to operating and written off against profit and loss as follows:

From May 1, 1899, to June 30, 1900.....	$ 893,013.89
From July 1, 1900, to June 30, 1901.....	566,622.54
From July 1, 1901, to December 31, 1901..	486,426.42
From January 1, 1902, to June 30, 1902...	524,818.60
	$ 2,470,881.45

In our report of last January we showed the Northern ore supply of the company to be in excess of 14,000,000 tons, or sufficient for the requirements of our Northern blast furnaces for a period of 28 years. Since then we have added, by way of favorable leases, 1,000,000 tons of Bessemer ore on the Mesabi range. The constantly increasing demand for the raw material entering into the production of iron, and the constantly increasing drain upon the fields of supply by the increased consumption thereof, as well as other recent developments, indicate that the estimate in our last semi-annual report of $21,750,000 as the value of the raw material in the ground then and now owned and controlled by this company was certainly moderate and safe.

Balance Sheet and Profits.

The balance sheet hereto annexed shows the exact condition of the company as of June 30, 1902. The inventories stand on the books, and are so stated in the balance sheet at cost prices for raw material and at *less* than cost prices for finished material, which prices are considerably below the present market. There can be no possibility of failure to realize more than the book values of these inventories. From the profit and loss statement it will be seen that the profits derived from the operations of the company during the last six months have not only been sufficient to provide for the payment of the preference dividend, but have also increased the surplus of the company to almost $2,000,000. All our properties are free from mortgage indebtedness, and as the available quick assets are largely in excess of the floating indebtedness, the financial condition of the company can be considered as satisfactory.

The orders now on our books, as well as the general condition of the business, the decreased cost of production and increased tonnage to be derived from new construction, justify the expectation that our earnings during the next year will be sufficient to pay the preference dividend and the cost of the new improvements in process of construction, and also add substantially to the available resources of the company.

For the benefit of our stockholders, we annex to this report a map, showing the location of the various properties of the company, as well as a tabulated statement of our supply of raw material and of the capacities of our plants.

Respectfully submitted,

ALEXIS W. THOMPSON, *President.*

BALANCE SHEET.

June 30th, 1902.

Assets:			
Real estate, plants, buildings, machinery and other permanent investments			$41,471,333 44
New construction:			
May 1, 1899, to June 30, 1900	$1,218,203 44		
July 1, 1900, to June 30, 1901	1,164,175 26		
July 1, 1901, to December 31, 1901	1,236,231 49		
January 1, 1902, to June 30, 1902	766,952 46		4,385,562 65
Stocks in sundry companies at cost			162,200 00
New gas pipe lines and gas leases, and prepaid royalties on ore and coal in excess of the amounts charged to operating			322,424 47
Inventories of raw and finished materials			3,046,649 61
Accounts and bills receivable			3,359,215 98
Cash on hand			1,125,185 65
			$53,812,571 80
Liabilities:			
Capital stock issued:			
Preferred	$20,852,000 00		
Less in Treasury	495,100 00	$20,356,900 00	
Common	$27,352,000 00		
Less in Treasury	161,000 00	27,191,000 00	$47,547,900 00
Accounts and bills payable			3,636,322 97
Preference dividend No. 12 paid July 1, 1902			356,245 75
Deferred installments on purchase of coal lands, payable in four annual amounts of $37,000 each			148,000 00
Reserve for taxes and insurance			120,380 14
Reserve for possible loss in collection of outstanding accounts and bills receivable, and to cover unknown contingencies			69,333 79
Profit and Loss account:			
Net profit during the last six months	$1,315,708 01		
Deduct two quarterly dividends of 1¾% each on preferred stock	712,491 50		
Surplus created during the last six months in excess of dividends on preferred stock	603,216 51		
Add surplus on the books on December 31, 1901	1,331,172 64		1,934,389 15
			$53,812,571 80

PROFIT AND LOSS ACCOUNT.

For the Six Months Ending June 30, 1902.

Profits from the business of the company after deducting all expenses, excepting improvements, renewals and repairs	$1,840,526 61
Less amount charged during the six months to operating, expended for improvements, renewals and repairs	524,818 60
Net profits during the six months	$1,315,708 01
Deduct two quarterly dividends, Nos. 11 and 12 of 1¾% each, on the preferred stock outstanding, paid on April 1, 1902, and July 1, 1902	712,491 50
Surplus for the six months in excess of dividends on preferred stock	$ 603,216 51
Surplus on the books on December 31, 1901	1,331,172 64
Surplus on the books on June 30, 1902	$1,934,389 15

In a statement appended to the report the company's resources in raw material and its pig iron and finished material capacity are given. The ore reserves of the Lake Superior properties are put at 15,325,000 tons; Southern ore is estimated at 70,000,000 tons. Northern coal, 18,500,000 tons; Southern coal, 50,000,000 tons. Northern pig iron capacity is 370,000 tons a year; Southern pig iron capacity, 230,000 tons. The company's rolling mills have a capacity of 860,000 tons a year and its steel mills, 410,000 tons a year.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

The Canadian Steel Corporation, with a capital of $18,000,000, has been organized at Welland, Ont., and the bonds of the corporation will soon be placed on the market. A charter will be secured from the Canadian Government together with a bonus of $5,000,000. The plant is to be located at Welland, on the Welland canal, where a site of 188 acres has been secured. One of the officials of the company is quoted as saying that the new company will be able to secure natural gas at a cost of 6 cents per thousand cubic feet and in the nature of comparison said that this gas costs Pittsburg manufacturers 42 cents. [This is a misstatement as the manufacturers of the Pittsburg district obtain their gas at a cost of from 5 to 10 cents per thousand.—ED.]

The Lebanon Valley Iron Co., Lebanon, Pa., has been incorporated with $75,000 capital. The new company will erect a puddling mill and will install a number of merchant mills.

The Effingham Tank Works, Effingham, Ill., has been incorporated with $35,000 capital. The company will manufacture steel pipes and tanks. G. M. Lecrone, H. B. Keply and T. W. Smith are the incorporators.

The Superior Machine Works, Chicago, has been incorporated with $25,000 capital. G. F. Burkhart, E. A. Burkhart and F. Burkhart are the incorporators.

The Valley Iron Co., of Birmingham, Ala., will be incorporated shortly with a capital of about $1,000,000 for the purpose of erecting a blast furnace and developing mineral lands located about 8 miles from Chattanooga, Tenn. Stock has been subscribed for by a number of Pittsburg, Cleveland and Southern steel manufacturers. The property owned by the company contains coal, iron ore and limestone and there will be no cost whatever connected with the collection of the raw materials at the furnace.

The Indiana Rolling Mill Co., of New Castle, Ind., has been incorporated with $300,000 capital. The directors are: Charles W. Mouch, David Kinsey, F. P. Maus, Charles S. Hernley and E. H. Bundy.

The Kast Copper & Sheet Iron Co., of Buffalo, N. Y., has been incorporated with $50,000 capital. Richard Kast and August Becker are the incorporators.

The Gas Engine Ignition Co., of Chicago, has been incorporated with $30,000 capital for the purpose of manufacturing ignition appliances for gas engines. G. A. Ramsey, H. C. Winchell and P. McGuffin are the incorporators.

The Central Malleable Iron Co., of Decatur, Ill., recently incorporated with a capital stock of $60,000, has secured an option on the foundry formerly operated by the Sattley Co., of Springfield, Ill., which is located at Decatur.

The Canonsburg Steel & Iron Works, of Canonsburg, Pa., has been organized with a capital of $250,000. The company recently increased the tin plate plant of the American Tin Plate Co. at that place for $125,000 and as soon as repairs can be made and a large amount of new machinery installed it will be placed in operation. It is probable that the new company will commence operations shortly after the first of next year. The following directors have been elected: John F. Budke, John M. Watson, George D. McNutt, Ralpt E. Martin, George Retberg, John G. Paxton, R. L. Park and H. A. Quail. Hon. John F. Budke is president and general manager; John M. Watson, vice president and business manager; George Retberg, secretary, and W. H. Paxton, treasurer.

Edmund Jeffries, of Canonsburg, Pa., is promoting the erection of an eight-mill tin plate plant at that place and a site has already been secured. A portion of the property purchased will be cut up into building lots and a part of the capital for the erection of the plant will be raised in this way.

The New Jersey Galvanizing & Tinning Works, with principal office at 50 Elm St., Newark, N. J., has been incorporated with a capital of $10,000.

The Wilson Automatic Bell Call & Fire Alarm Co., of Buffalo, has been incorporated with a capital of $100,000. It will erect a plant for the manufacture of electric signals, fire alarms, electric appliances, specialties and machinery. The directors are James W. Wilson, of Rome, and Wilbur H. Craft, F. S. Parker, F. E. Haynes and Edward J. Bowen, of Buffalo.

The Girard Foundry & Machine Co., Girard, O., has increased its capital from $10,000 to $25,000.

The Ritter Electric Co., Cincinnati, has increased its capital from $15,000 to $50,000.

The American Gas Engine Co., Sheboygan Falls, Wis., has been incorporated with a capital of $50,000.

The Reddin Iron Works, of Syracuse, N. Y., has been incorporated with a capital stock of $15,000. The officers are: M. C. Reddin, president; E. C. Scheibe, vice president; A. S. Reddin, secretary.

The Standard Tin Plate Co., of Canonsburg, Pa., has been organized with a capital of $300,000 to build an eight mill tin plate plant on a tract of land donated by the Cecil Improvement Co. in the East End of Canonsburg. The directors are J. V. H. Cook, E. B. Boyle, J. L. Cockins, C. C. Johnson, Moses Hickman, and Geo. C. McPeake, of Canonsburg; Joseph Underwood, of Roscoe; Wm. I. Berryman and S. A. Taylor, of Pittsburg; E. T. Hitchman, of Mt. Pleasant, O.; H. M. Bermis and Albert Ross, of Monessen, and James S. Elliott, of Fayette City. The officers are: E. Jeffries, president and general manager; H. M. Bermis, secretary; J. V. H. Cook, treasurer. It is expected that ground will be broken at once.

The Machine Forging Co., of Cleveland, has been incorporated with a capital of $25,000 by Harry S. French, Norman C. Komrans, H. E. Parrish, Carl Silver and Lyman B. Beers.

Fires and Accidents:—

The plant of the Phoenix Horseshoe Co., Joliet, Ill., was again damaged by fire last week; loss, $6,000.

New Construction:—

The Brylgon foundry, Reading, Pa., has outgrown its quarters, although it has been in operation only 15 months. A larger steel casting plant will be erected.

The Cuyahoga Steel & Iron Specialty Co., of Cuyahoga Falls, O., has increased its capital stock from $75,000 to $200,000 in view of the erection of an open-hearth furnace for the manufacture of its own billets, as already noted.

The Wilbur Pattern & Wood Working Co., Toledo, has purchased four lots on which a pattern shop will be erected.

The new foundry to be built in East Buffalo by Chas. F. Dunbar, of that city, and N. Sullivan, of Detroit, will be for the manufacture of castings and general foundry purposes and will employ 300 men. The plant will be in operation on or before Jan. 1. A feature will be a lavatory for the men enabling each to take a shower bath daily.

The Hocking Valley Railroad will soon begin the building of a new boiler house at the Columbus, O., shops. It will be 200x100 feet and will be used entirely for the repair and building of boilers and tanks.

Work on the new buildings to be erected by the Hayden-Corbett Chain Co., in Columbus, O., has been begun.

Ground has been broken for the building of the Buffalo & Susquehanna Iron Co.'s blast furnaces at Stony Point, N. Y. A contract has been made with the Allis-Chalmers Co. for eight large blowing engines of the cross-compound, vertical steeple type. These engines are about 40 feet in height, and the flywheel of each weighs 50 tons.

Plans for the new steel bridge to be built at East Youngstown, O., by the P. & L. E. Ry. Co., have been completed and work will be commenced soon. The cost will be $100,000.

The Pittsburg District:—

For the Susquehanna Iron & Steel Co.'s new plant, at Columbia, Pa., the Pittsburg Gage & Supply Co., of Pittsburg, will furnish three 250-h. p. water tube boilers. The same company recently closed contracts with the National Steel Co. to furnish a complete White Star filtering system for a vertical cross compound blowing engine, also filtering systems for the electric department of the Carnegie Steel Co.'s Homestead works and for the Wheeling Steel & Iron Co., Wheeling, W. Va.

The Geo. A. Hogg Iron & Steel Foundry Co., of Pittsburg, manufacturer of rolling mill machinery, is equipping the an-

nealing furnaces of the National plant of the American Tin Plate Co., at Monessen, Pa., also the United States plant, at Demmler, Pa., and the American mill, at Elwood, Ind., with the Freeman furnace charger.

During the month of July the daily average of cars built at the plants of the Pressed Steel Car Co., of Pittsburg, amounted to 103 which broke all previous records. If the cars produced in the month were coupled together in one train they would stretch out a distance of 20 miles.

Last week three barge loads of finished material, including wire and wire nails were shipped from the Rankin, Pa., plant of the American Steel & Wire Co. Each barge contained 50 carloads of material. It was consigned to the new warehouse established by the American Steel & Wire Co. at St. Louis, Mo.

The Monarch Iron Co., with a capital of $125,000, will be organized by W. P. Lemley, George W. Jope and others of Pittsburg, for the purpose of erecting a plant to manufacture refined iron bars. Several sites are under consideration, and it is probable that the plant will be located at Sistersville, W. Va. The company proposes to install 20 puddling furnaces, two scrap furnaces, a muck mill, and three finishing mills respectively, 18, 16 and 12 inches. The manufacture of light rails is also anticipated. The office of the company is at 510 Bijou Bldg., Pittsburg.

General Industrial Notes:—

The Riter-Conley Mfg. Co., of Pittsburg, which has contracts for the erection of the Allis-Chalmers plant at West Allis, near Milwaukee, has signed a scale presented by the Milwaukee Bridge and Structural Iron Workers' Union, by which the men will receive minimum wages of 40 cents an hour, an increase of nearly 25 percent over the wages paid during last year. The company has nearly 10,000 men at work about Milwaukee.

The Continental Iron Works, Wheatland, Pa., went on double turn this week.

The Buffalo Forge Co., of Buffalo, N. Y., has recently received orders for the following: Two 70-inch steel plate steam fans, for heating and ventilating, direct connected to two Buffalo Forge Co. engines, and one 130-inch ¾ housing standard steel plate pulley fan for mechanical draft, to be shipped to Copenhagen, Denmark; one induced draft plant and one 23-h. p. engine for electric light plant in Dutch Guiana, South America; five Buffalo engines of 45-h. p. each for driving generators, and one 38-h. p. engine for a pumping equipment, to be installed in a sugar factory near Manzanillo, Cuba; one 20-h. p. Buffalo vertical class "A" engine to be shipped to Gustenunde, Germany; one 15-h. p. double vertical single acting Buffalo engine to Gothenberg, Sweden; one 60-inch standard steel plate fan for ventilation, to be shipped near Glasgow, Scotland; one 140-inch steel plate fan with heaters complete for heating and ventilation to Barrow-in-Furness, Eng.; one standard 80-inch fan and heater complete and one 90-inch pulley fan for ventilation and one 30-h. p. horizontal Buffalo engine to London, Eng.; one 120-inch fan and six 60-inch fans to Manchester, Eng.; one 80-inch standard steel plate fan for mechanical draft to Victoria, B. C.; one 110-inch steel plate pulley fan direct connected to a cylinder above shaft Buffalo engine for mechanical draft to Halifax, N. S.; one 70-inch fan and one 100-inch fan for heating and ventilating purposes, to Portland Ore.

The Atlanta Rolling Mill & Tin Plate Co., Atlanta, Ind., has let the contract for the steel construction for its new eight-mill tin plate plant to the Garry Iron & Steel Roofing Co., of Cleveland. The Bass Foundry & Machine Co., of Ft. Wayne, Ind., have the contract for engines and the mills will be built by the Lloyd Booth department of the United Engineering & Foundry Co.

The new plant of the Novelty Iron Co., of Canton, which takes the place of the plant destroyed by fire last March, is nearly completed. The capacity of the new plant will be considerably larger than that of the old.

The Columbus Iron & Steel Co., Columbus, O., has purchased a tract of land adjoining its plant in order to provide for an extension if there ever should be occasion for its use. The company has at present no plans for the utilization of the newly purchased land.

In the consolidation of its Knoxville and Harriman plants at Knoxville, Tenn., the Knoxville Iron Co. is adding a large amount of new machinery. The new works will be completed in October and will have a capacity of 50,000 tons a year. The puddle mill building will be 396x80 feet; the heating furnace building, 240x60 feet; the rolling mill building, 240x75 feet and the run-out sheds and warehouse, 250x100 feet. The structural iron work is now all on the ground and erection is being pushed as fast as possible.

The Canton Pump Co., Canton, O., is enjoying a rapid increase in its foreign trade. The domestic trade of the company is also flourishing.

Albert Graham, Harry C. Graham and Chas. J. Graham announce that they have succeeded John Charles & Co., of Allegheny, Pa., under the name of the Graham Nut Co. The works are in Allegheny and the offices in Pittsburg.

The sheet mill plant of the Parkersburg (W. Va.) Iron & Steel Co., which has now been in operation for about seven months, has five mills at work. A new annealing furnace of special design is being built to take care of the increased output, and when this is in shape a sixth mill will be put on. The warehouse department is being extended by the erection of an additional 36x50 feet. A new bar mill is about completed, and is installed in a building 110x200 feet. The engine is of 600 h. p. The mill is equipped with automatic bar shears and ordinary alligator jaw shears, which have been tested and work satisfactorily. The bar mill will probably be started next week and will have an output of about 60 tons per turn. It will be run single turn at the start and later two or three turns.

The Francis Reed Co., Worcester, Mass., has removed to larger quarters at 41-43 Hammond St.

Farrar & Trefts, 58 Perry St., Buffalo, are filling an order for five 150-h. p. gas engines for the Liggett Spring Co., of Pittsburg, to drive generators.

The Western Tool Co., of Lansing, Mich., which makes a specialty of thread cutting tools, was incorporated in March, 1902, succeeding to the Van Dervoot tap and die business, long carried on at Lansing. The Western Tool Co. is also a maker and jobber of machinists' tools. H. H. Larned is president, J. P. Edmonds, vice president, and A. T. Van Dervoort, secretary.

The machine molders employed in the foundries at Louisville, Ky., have gone on a strike for an advance of 10 percent in wages. The men have received small advances during the past year and the employers now refuse to consider their last demand for an increase. The plants affected are as follows: Phoenix Foundry and Machine Works; Henry Vogt Machine Co.; National Foundry & Machine Co., and W. E. Caldwell & Co. The men are receiving at present from $2.75 to $2.85 per day.

After an idleness of eleven weeks, due to a strike of the puddlers, the Penn Iron Works, Lancaster, Pa., resumed operations last week. The puddlers struck for an advance in wages from $4.25 to $4.50 and the company conceded their demands. The helpers and finishers also received a slight advance.

The furnace of the Zenith Furnace Co., Duluth, Minn., will be blown in about Sept. 1, although much work still remains to be done about the plant. Plans have been prepared for the erection of a cast house 60x64 feet and an engine house.

The Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., has blown in its city furnace No. 2, which has been out for repairs for some time. The company now has six furnaces in blast and the outputs for the months of June and July were record breakers.

Geo. G. Blackwell Sons & Co., Ltd., of Liverpool, Eng., have sent to the trade a little pamphlet telling of the work of their Lion Brand S. A. M. alloy. This alloy is added to molten steel or iron for the prevention of blowholes in the ingot or casting. It consists of several metals, such as aluminum and manganese, having a greater chemical affinity for oxygen than the metals to be cast, and one or more electro-negative non-metallic metalloids, such as silicon or boron. By taking up the oxygen from the casting the elements of this alloy are converted into single, double or multiple silicates, borates, etc., which produce a readily fusible slag. This slag is quickly formed and rises in the form of globules through the liquid and heavier material of the casting, rendering the latter free from blowholes.

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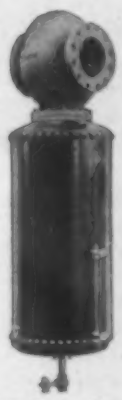

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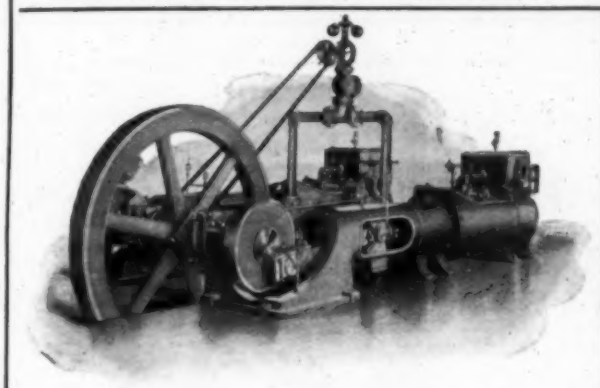

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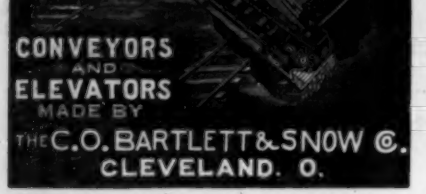

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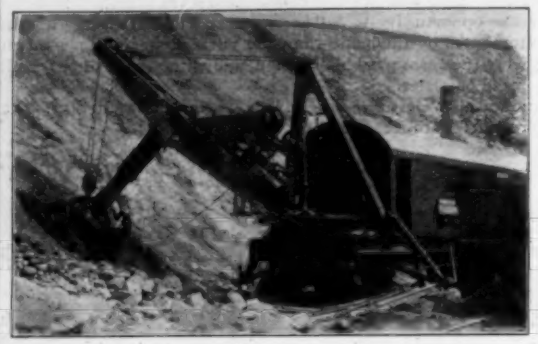

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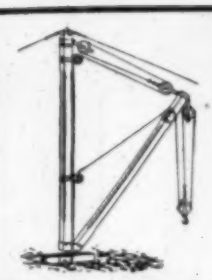

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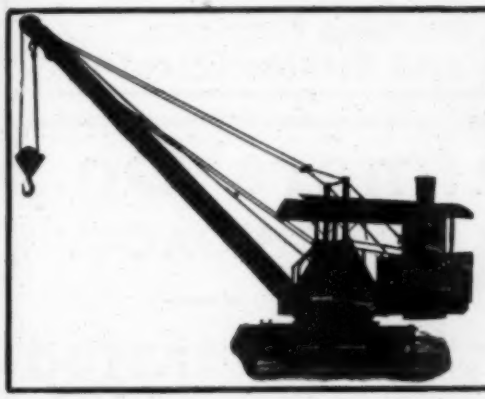

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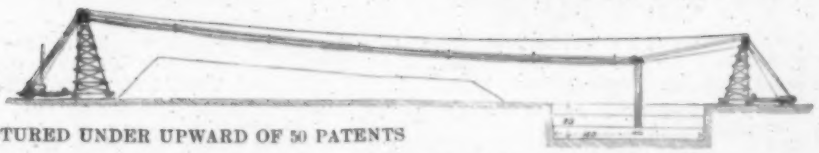

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